

Theory for Action:
Integrated Assessment Models to address
climate change and social inequality

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Course content

Climate change and increasing inequality have emerged as twin threats: we are not only failing to solve these problems but are in fact worsening them. Inertia and reluctance to change are in part due to the difficulty in understanding complex systems. One of the most promising approaches is given by the so-called Integrated Assessment Models (IAMs) that merge diverse knowledge, data, and methodologies to address complex environmental problems and their connections with the economic system. IAMs provides with a coherent quantitative framework to build Policy scenario analysis designed to identify fine-tuned policies and envision feasible pathways toward an equitable low-carbon transition.

Students will be guided through the main theoretical concepts, methodologies, and real-case applications. At the end of the course the student will be able to apply IAMs and to evaluate synergies, trade-off and side-effects related to the implementation of multiple policy packages to reach several (possibly contracting) goals.

Main Topics

- i. *Dealing with complex systems*
 - a. Main concepts and definitions
 - b. Integrated Assessment Models: merging input-output, network analysis and system dynamics

- ii. *Building Policy Scenarios*
 - a. Beyond IPCC: how to evaluate multiple policy packages in the real world
 - b. Applications and examples in Vensim DSS and Matlab

Note: this course will extend what discussed in “HAPPINESS, SUSTAINABILITY AND WELLBEING” with a focus on methodological issues and modelling.

References

- D’Alessandro, S., Cieplinski, A., Distefano, T., & Dittmer, K. (2020). *Feasible alternatives to green growth*. *Nature Sustainability*, 3(4), 329-335.
- Hamilton, S. H., ElSawah, S., Guillaume, J. H., Jakeman, A. J., & Pierce, S. A. (2015). *Integrated assessment and modelling: overview and synthesis of salient dimensions*. *Environmental Modelling & Software*, 64, 215-229.
- Keyßer, L. T., & Lenzen, M. (2021). *1.5 C degrowth scenarios suggest the need for new mitigation pathways*. *Nature communications*, 12(1), 1-16.
- Sterman, J. D. (2002). *All models are wrong: reflections on becoming a systems scientist*. *System Dynamics Review: The Journal of the System Dynamics Society*, 18(4), 501-531.

Related Events

1) Workshop on Behavioural Ecological Economics, University of Florence (DISEI), 10-11 July 2023

Submissions are now open to participate in the Workshop on Behavioural Ecological Economics, which will take place in Florence on July 10th-11th, 2023. The workshop focuses on the applications of behavioural and experimental economics to ecological economics and is designed to foster new collaborations in this emerging field of research.

Participation is free of charge and young researchers may receive financial support.

To participate, please submit your long abstract by **April 16th, 2023**.

For more information and to SUBMIT YOUR ABSTRACT, please visit <https://ecologicaleconomicstuscany.ec.unipi.it/workshop/2023-2/>

2) Summer School in Ecological Economics, 11-15 July 2023, University of Pisa (Le Benedettine)

Applications are now open for the Summer School in Ecological Economics of the University of Pisa that will take place 11-15 July 2023 at Centro Congressi “Le Benedettine”, Pisa – ITALY. The DEADLINE to apply is 01 April 2023.

The programme this year is focused on “Leveraging Ecological Economics to advance the Sustainability Transition”. Admitted students will also have the opportunity to participate in the workshop on “Behavioural Ecological Economics”, Florence 10-11 July, and in the Hiking Summer School, 16-19 July on the Apuan Alps.

Cheap accommodation is available in same location of the summer school, at the “Residence Le Benedettine” (http://en.residence.unipi.it/home_en/), while fee reductions are available thanks to the financial support from the University of Pisa and the European Society for Ecological Economics (ESEE). Information is available at <https://ecologicaleconomicstuscany.ec.unipi.it/summer-schools/>