

## SYLLABUS

<b>Name of the course:</b>	Modelling in Ecological Economics			
<b>Teachers:</b>	Juan Manuel Campana and Valeria Jimenez			
<b>University / organisation:</b>	Berlin School of Economics and Law			
<b>Language of teaching:</b>	English			
<b>ECTS:</b>				
<b>Semester (S1, S2, S3 or S4):</b>	<input type="checkbox"/> S1	<input checked="" type="checkbox"/> S2	<input type="checkbox"/> S3	<input type="checkbox"/> S4
<b>Teaching method(s):</b>	<input checked="" type="checkbox"/> Lecture courses		<input type="checkbox"/> Flipped classroom	
	Other:			
<b>Type(s) of evaluation:</b>	<input type="checkbox"/> Sitting exam		<input checked="" type="checkbox"/> Written report	
	<input checked="" type="checkbox"/> Oral defence		<input type="checkbox"/> Group project	
	Other / Written assignment and oral presentation of advanced comments: preliminary results			
<b>Expected deadline(s) for the evaluation(s)</b>	Oral presentation: last three weeks of July			
	Written assignment: first half of August			
<b>Expected date of final results:</b>	Mid-September			
<b>Summary of the content:</b>	<p>Students will develop a strong foundational understanding of ecological economics, emphasizing the concept of the economy as a subsystem of the biosphere, constrained by planetary boundaries, with strong implications for the macroeconomy. They will develop the ability to understand and critically evaluate different ecological macroeconomic models and assess the applicability of different methodologies to address diverse ecological-economic issues. Through hands-on laboratory exercises, students will acquire some practical modelling skills, introducing them to the design, simulation, and analysis of different economic systems. This course offers students introductory necessary tools to conduct independent research and tackle real-world challenges in ecological economics.</p>			
<b>Indicative list of topics:</b>	<ol style="list-style-type: none"> <li>1. Introduction to Ecological Economics: Economics and the environment, stylized facts and trends, emerging strands in the literature, overview of analytical and modelling methodologies.</li> <li>2. Mathematical tools for analytical and simulated models: linear algebra, static models, dynamic systems, and stock-flow consistency (SFC).</li> <li>3. Analytical ecological macroeconomic models: uses, analysis, and policy implications.</li> <li>4. Ecological SFC models: uses, scenarios, methods, and policy implications.</li> </ol>			

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	<ol style="list-style-type: none"> <li>5. Ecological SFC simulations, including laboratory sessions with R software.</li> <li>6. Input-output (IO) analysis and ecological applications: emissions, biodiversity, unequal exchange and multi-regional input-output (MRIO) analysis. Including laboratory sessions with R software.</li> <li>7. Introduction to ecological IO SFC models: fundamentals, advantages and limitations.</li> </ol>
<p><b>Short bibliography:</b></p>	<p>Common, M. S., &amp; Stagl, S. (2009). Ecological economics: An introduction (4. printing). Cambridge Univ. Press.</p> <p>Dafermos, Y., Nikolaidi, M., Colesanti Senni, C., George, A., von Jagow, A. (2022). DEFINE: An ecological stock-flow consistent modelling framework. <a href="https://define-model.org/define-global/">https://define-model.org/define-global/</a></p> <p>Gandolfo, G. (1980). Economic dynamics, methods and models (2d., rev ed). North-Holland; sole distributors for the U.S.A. and Canada, American Elsevier Pub. Co.</p> <p>Miller, R. E., &amp; Blair, P. D. (2009). Input-output analysis: Foundations and extensions (2nd ed). Cambridge University Press.</p> <p>Nikiforos, M., &amp; Zezza, G. (2017). Stock-Flow Consistent Macroeconomic Models: a Survey. <i>Journal of Economic Surveys</i>, 31, 1204-1239.</p> <p>Pasarella, M. (2024). Marxianomics. <a href="https://www.marcopasarella.it/en/">https://www.marcopasarella.it/en/</a></p> <p>Prante, F., Kohler, K. (2023). DIY Macroeconomic Model Simulation. <a href="https://macrosimulation.org/">https://macrosimulation.org/</a></p> <p>Sayama, H. (2015). Introduction to the Modeling and Analysis of Complex Systems. Open SUNY Textbooks.</p> <p><b>A detailed reading list will be handed out in class.</b></p>