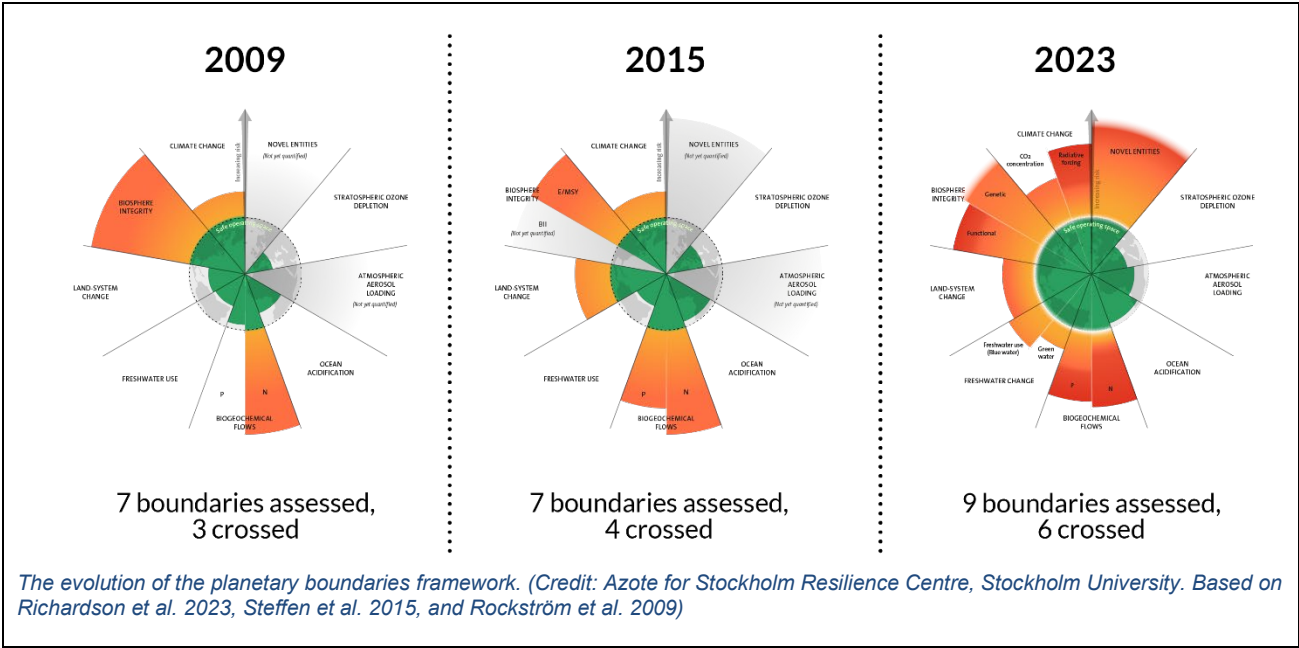


Syllabus for « Sustainability in my Research” ENG-650



Content

In the current era of socio-ecological crisis, research must step up and play a role to shape a future sustainable and just society. Sustainability must be integrated in research activities and research activities should find paths to contribute to sustainability. This challenge cannot only be interpreted as a disciplinary or even as an interdisciplinary problem; it requires first and foremost a preliminary effort to develop specific transversal skills.

This class aims to offer PhD student an introduction to key sustainability concepts as well as a space for students to reflect on how they could contribute further to sustainability, by acting on their research questions, as well as on their research practices.

The course is hands-on, and it includes a serious-game workshop to introduce the tragedy of the commons, a journal-club on landmark sustainability papers, an individual project tailored to the specific research of each enrolled PhD student as well as methodological and, when possible thematic, coaching for the individual project.

Learning Outcomes

By the end of the course, the student must be able to:

- Apply research practices to sustainability by:
 - A. Formulating a research question/project to solve a sustainability-related issue (and/or)
 - B. Identifying and prioritizing actions to make research practices more sustainable
- Develop leadership skills to act effectively on sustainability-related challenges
- Explain key sustainability concepts to a heterogeneous audience

Transversal skills

This is a transversal skills course, with the main accent is on these 3 skills:

1. System thinking
2. Ability to communicate effectively to a diverse audience
3. Identify and assume the different roles, including leadership, that are involved in well-functioning teams.

1. Presentation of the team

Teachers and EPFL Speakers

Michka Mélo	Sustainability Coach (EPFL)
Jacopo Grazioli	resp. Sustainability Education / atmospheric scientist (EPFL)
Mélanie Studer:	Sustainability Officer (EPFL)
Joan Suris	Resp. Sustainability Office (Life Science faculty)
Juliane Miani	Sustainability Officer (Life Science faculty)

Some coaches, either the sustainability officers of the various faculties or some experts on selected topics can be solicited to provide help during the project phase of the course. They will be introduced during the course.

2. Structure and global steps

This course accounts for 2 ECTS, so 4h of work per week on average although the course of the workload is not uniformly distributed. The course includes

- A serious game session on the tragedy of the commons and an introduction to the course
- A first exchange session, where participants will present some landmark papers about selected sustainability topics to their peers. One paper is presented by a couple of participants.
- Thematic presentations/testimonies on: (i) doing research in a sustainable way, (ii) stirring research careers for a sustainable future.
- Workshop “Leadership skills for Sustainability”
- Individual project following one of the two themes (i or ii, above)

3. Course calendar, 2024

Frontal classes

In-class active learning

Homework delivery

September		
12	AAC106 13:00 – 17:00	Introduction to the course. Serious game on the tragedy of the commons. Introduction of the next assignment: journal club
30	CM1113 9:15 – 17:00	(exact time adapted according to course attendance) Journal club presentations on sustainability landmark papers
October		
01	CM1113 9:15 – 17:00	Morning Presentation: Sustainability in Research Practices Presentation: Scientists facing Anthropocene Afternoon Introduction of the next assignment: final project Sustainability leadership workshop
November		
28	-	Hand-in individual project deadline
December		
03	CM1113 9:15 – 17:00	Final presentation of the projects

4. 2024 guest speaker



Prof. Julian Carrey INSA Toulouse

Julian Carrey is a professor at INSA Toulouse. He completed his thesis at the CNRS/Thales Joint Physics Unit, Orsay, defending it in 2001. He then did a post-doc at the Center for Magnetic Recording Research (University of California, San Diego) and one at CEA Saclay. He joined the LPCNO in September 2004 and is currently using magnetic nanoparticles for applications in oncology and catalysis. His interest in low-tech and his thoughts on post-oil technologies have recently led him to begin research into solar metallurgy.

Prof. [Julian Carrey](#) is an example of a scientist actively engaged for sustainability. He will bring us a viewpoint about the role of scientists in the context of the major sustainability issues of our times.

His intervention will give us some insights on the following topics (and beyond):

- Reminder of Anthropocene and planetary boundaries
- The three reasons for scientists' commitment
- Reducing the carbon footprint of our labs - Labs 1.5
- Research topics and their reorientation. Personal examples with scientific research and low-tech: history of techniques and societies, solar metallurgy, domestic solar cooking, life cycle analysis.
- Involvement in the “city”: example of [Atécopol](#) and what they do
- Discussion on neutrality and engagement
- ...

5. Journal club

The journal club is the first of the two assignments of the course which require homework. This activity will allow students to practice: (i) communication to a diverse audience on rather complex topics, (ii) collaboration in the preparation and delivery of a presentation. It will also allow us to cover some of the most important thematic topics of sustainability, thus getting exposed on some knowledge on the subject as well.

We will select a certain number of landmark papers on sustainability that cover different subjects. A couple of students will work together on one paper and prepare a presentation to be shared with the rest of the classroom on the next class. The requirements for this work are as follows.

Deliverables	A presentation , in the format of your choice (slides, whiteboard, poster). You will have about 10 minutes of time for the delivery + up to 20 minutes of questions and discussion in the classroom. The discussion will be open and based on the content of the paper and on how you prepared the presentation.
Presentation content	Try to focus some energy to make the presentation: • Adapted to our audience (highly educated but with diverse background). • Capable of pointing first to the main, large-scale issues described in the paper, while leaving space to discuss details. • Do not hesitate to bring your own questions and doubts about the paper to the classroom, to discuss them together.

6. Final project

The final project is an individual essay covering one of the two suggested areas of reflection:

- A. Define sustainability-related research questions you could explore within or after your PhD. Defend, with supporting evidence, how it could contribute to solve a sustainability-related issue.
- B. Identify and prioritize a list of measures you could implement in your current research to make it more sustainable. Back your list and priorities with evidence.

The project work should be based on present research or the foreseen future research of the participants, so ideally it should be a helpful and actionable (preliminary) resource to incorporate those reflections. If you have an idea that it does not seem to fit A and B, please reach out to the teachers. We will be happy to find the format and topic that best fits your actual research context.

Deliverables	A report: 2-3 pages including literature (if needed) and images (if needed) is enough, but anyone who wants to develop it further is welcome to do so. It should allow other scientists outside your field to understand your research context and the areas of reflection (among A and B above) that you are tackling, and why. A presentation in the format of your choice (slides, whiteboard, poster). You will have about 10 minutes of time for the delivery + time for questions and discussion in the classroom. We remind you to adapt your delivery to the diversity of the knowledge of the audience. <u>We encourage you to share, at the end of your presentation, the open questions you may have and also the aspects that you found the hardest / most complicated / most puzzling in your reflection</u>
---------------------	--

7. Evaluation criteria

Assignments are delivered in time and with good quality.