

BIO-413

Planetary health

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Cursus	Sem.	Type
Life Sciences Engineering	MA1, MA3	Opt.
Minor in Engineering for sustainability	H	Opt.

Language of teaching	English
Credits	4
Withdrawal Session	Unauthorized Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
Hours	4 weekly
Lecture	2 weekly
Exercises	2 weekly
Number of positions	40

It is not allowed to withdraw from this subject after the registration deadline.

Summary

This course provides an overview of global environmental change through the perspective of the planetary boundaries and examines how human health is interlinked with social and ecological contexts.

Content

Students will explore key global problems such as climate change and biodiversity and their links to planetary health, including an in-depth examination of infectious diseases. The course will give an overview of bioengineering strategies to reduce environmental impacts, and the role of metabolic engineering in planetary health. From week three students will work on a group project based on a real-world planetary health challenge to identify potential solutions to this challenge.

The course is structured in **four modules**, each led by a different expert:

- Introduction to planetary health and sustainability (Lecturer: Nicola Banwell)
- Human impact for emerging infectious diseases (Lecturer: Melanie Blokesch)
- Bioengineering strategies to reduce environmental impacts (Lecturer: John McKinney)
- Metabolism and metabolic engineering (Lecturer: Giovanni D'Angelo)

Learning Prerequisites**Important concepts to start the course**

Prior knowledge of basic concepts in biology and life sciences is strongly recommended.

Learning Outcomes

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

- Explain key concepts relevant to planetary health and sustainability.
- Analyze the interdependencies between human health and environmental sustainability using a systems thinking approach.
- Formulate appropriate questions, conceive sustainable solutions to these questions, and justify their choices in the context of planetary health and sustainability.

Transversal skills

- Take account of the social and human dimensions of the engineering profession.
- Take responsibility for environmental impacts of her/ his actions and decisions.
- Demonstrate the capacity for critical thinking
- Make an oral presentation.

Teaching methods

Lectures. Workshops. Group projects. Discussion rounds and exercises.

Expected student activities

- Group project on a real-world planetary health challenge
- Complete written exercises
- Participate in class discussions

Assessment methods

Continuous control during the semester