

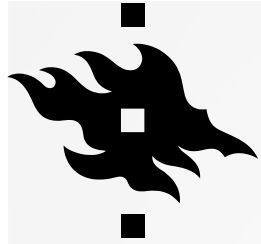


## TEACHERS FOR SUSTAINABILITY -NETWORK

### WORKSHOP 1: GETTING STARTED WITH SUSTAINABILITY COURSE (SUST-001) AND DIALOGUE ON SUSTAINABILITY TEACHING

FRIDAY 18.11.2022  
9:15-10:45

- WHAT IS YOUR NAME? WHAT FACULTY OR FIELD OF RESEARCH AND TEACHING YOU ARE COMING FROM? PLEASE ANSWER IN ZOOM CHAT.
- WHAT DO YOU EXPECT FROM THE TEACHERS' FOR SUSTAINABILITY NETWORK? WHAT KIND OF ACTIVITIES WOULD BE MOST INTERESTING OR RELEVANT FOR YOU? PLEASE ANSWER IN TEACHERS FOR SUSTAINABILITY -TEAMS: [HTTPS://BIT.LY/TFS\\_TEAMSGROUP](https://bit.ly/tfs_teamsgroup)



# PROGRAMME

**Opening and getting started (9:15 ~9:25)**

**Short introduction to Sustainability Course SUST-001 and INTRO-module learning materials (9:25–9:40)**

**Group discussions in English and Finnish (9:40-10:15)**

Assignments in the Intro-module: Students' concept maps on sustainability

**Summary (10:15–10:45)**

Groups' reflections and your best practices in sustainability education



# TEACHERS FOR SUSTAINABILITY (TFS) -NETWORK

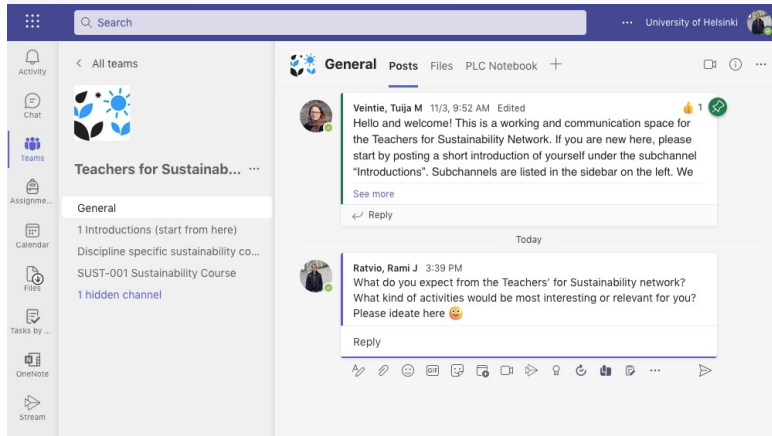
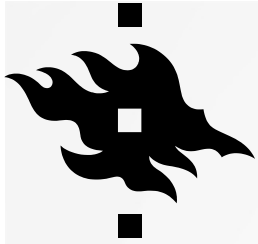
**Active network that connects people at the University of Helsinki who**

- **work in the field of sustainability and pedagogy**
- **develop sustainability education and study units**
- **participate in teaching sustainability courses**

**Platform for**

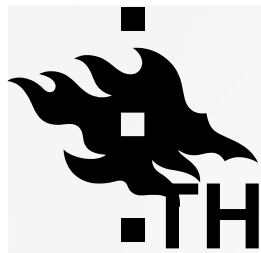
- **knowledge sharing**
- **discussions and ideas**
- **peer support**
- **collaboration across disciplines and degree programmes**

**Join the Team: [https://bit.ly/TfS\\_Teamsgroup](https://bit.ly/TfS_Teamsgroup)**



# EXPECTATIONS AND IDEAS

- What do you expect from the Teachers' for Sustainability network? What kind of activities would be most interesting or relevant for you?
- Please answer in Teachers for Sustainability – Teams frontpage: [https://bit.ly/TfS\\_Teamsgroup](https://bit.ly/TfS_Teamsgroup)
- You are welcome to post your suggestions during and after the workshop!
- When possible, please introduce yourself in brief on the Introductions -channel in Teams.



# REGISTRATION FOR THE SUSTAINABILITY COURSE MOODLE

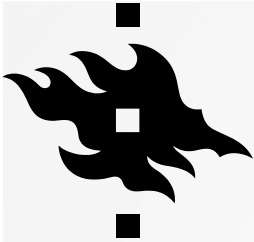
The screenshot displays the Moodle interface for the course 'Teachers for Sustainability - Sustainability Course SUST-001 Preview version'. The left sidebar contains a list of course sections, including 'Welcome to the Sustainability Course', 'Course instructions', and various modules (A-F). The main content area features a 'Welcome to the Sustainability Course' banner with images of nature and people, followed by 'Course instructions' and a 'Course structure' diagram. The right-hand panel shows progress tracking for mandatory assignments in the INTRO, SOLUTIONS, and MODULE A sections, with progress bars and 'NYT' (Not Yet Taken) indicators.

- Please login to our course Moodle site "Teachers for Sustainability - Sustainability Course SUST-001 Preview version"

<https://moodle.helsinki.fi/course/view.php?id=55017>

- Use HAKA-login (=your university account and password), enrolment key: tfsasianelephant2022





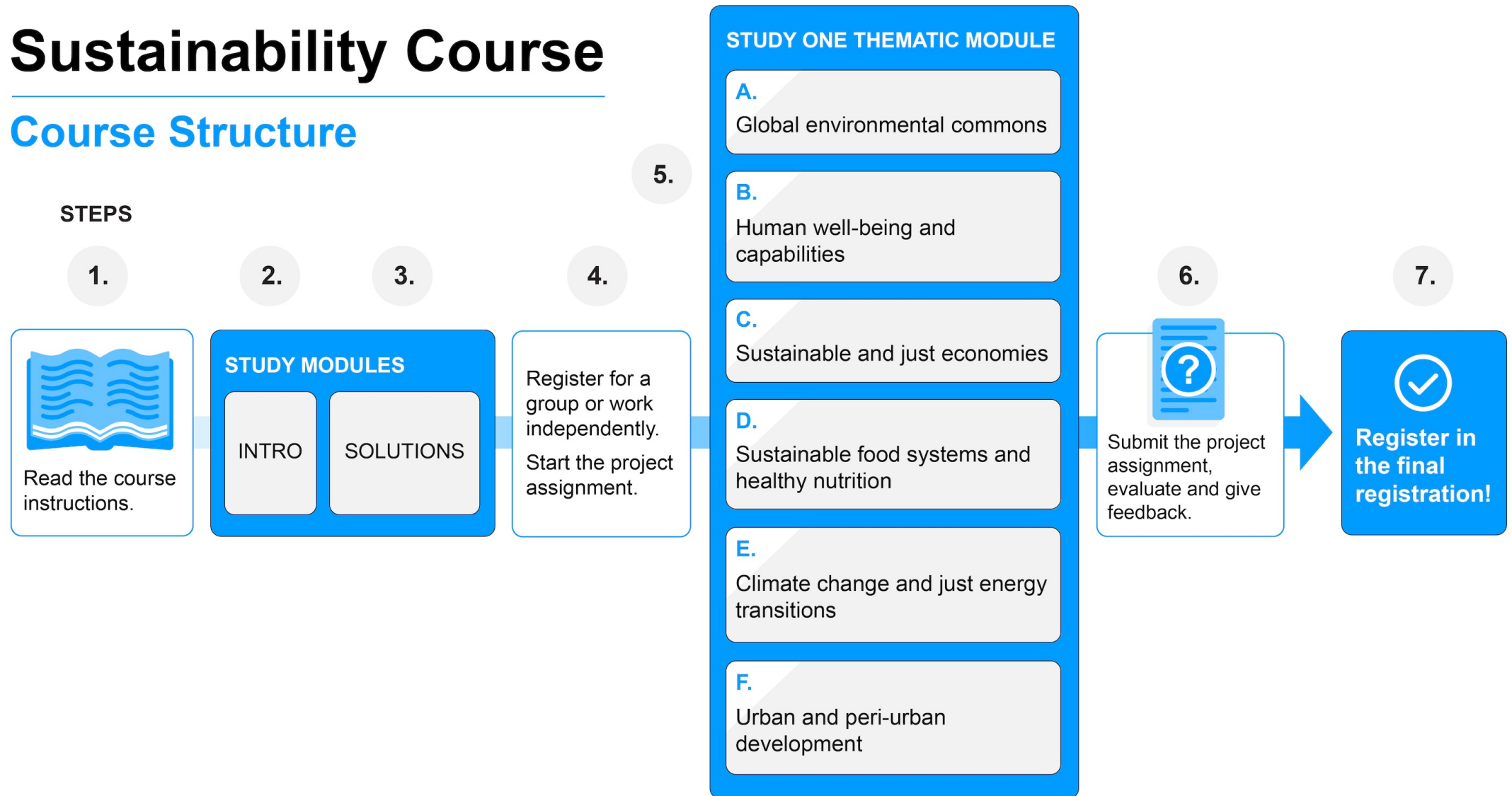
# **LEARNING OBJECTIVES:**

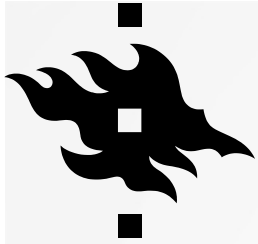
## **AFTER COMPLETING THE SUSTAINABILITY COURSE YOU...**

- Have become acquainted with the complexity and multidisciplinary nature of sustainability issues and the ethical and philosophical dimensions of sustainability.
- Understand the changes, and the related processes, phenomena and potential solutions to sustainability challenges related to course themes. You have become acquainted with the themes and in more depth with one of six themes: a) Global environmental commons, b) Human well-being and capabilities, c) Sustainable and just economies, d) Sustainable food systems and healthy nutrition, e) Climate change and just energy transitions f) Urban and peri-urban development.
- Have considered your roles as experts, actors and members of society in solving sustainability issues and have been given tools for solutions.
- Are able to discuss sustainability-related questions in an empathetic and constructive manner and understand other people's viewpoints and be able to take them into account.
- Can apply knowledge and skills related to sustainability as expert in your field.

# Sustainability Course

## Course Structure





# LEARNING CONTENT



- **BOOKS:** Modules are divided into subsections called books. There is a total of 2–4 books per module, and each of the books contains text, images, videos and assignments.

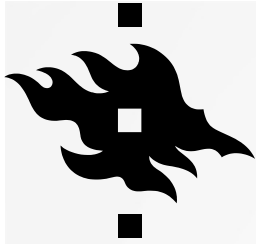


- **OPTIONAL ASSIGNMENTS:** Assignments indicated with this icon are optional. They are embedded inside the books, and help you to activate your learning process and produce knowledge collaboratively together with other course participants.



- **MANDATORY ASSIGNMENTS:** Assignments indicated with this icon are mandatory and part of the course evaluation. They are listed at the front page of each module and also linked inside of each book.
- **PROJECT ASSIGNMENT:** During the course, you will conduct a sustainability project work in group. A group work will start after completing the module 2. More detailed instructions for the group work can be found from the course moodle page in Course Instructions.





# COURSE EVALUATION AND WORKLOAD

- 3 ECTS = 80,5 hours of work. Approximate workload in hours for different parts of the course will be:
  - Orientation, Intro-module and Solutions-module: 34,5 hours
  - Thematic module (A-F): 23 hours
  - Project work (including evaluation): 23 hours
- The course is graded on pass-fail -scale.
- For passing the course, students are required to submit (and pass) all the mandatory assignments and project assignment. The final grading will be done at the end of the course.
- For the project assignment students are asked to submit peer-feedback and a self-assessment, where they also assess their peers. Guidelines for the grading of the Project assignment are shown in the Project assignment section.
- General submission deadlines for the assignments are listed in the Course instructions (see “Course instructions and schedule” → “Course schedule and Zoom-link”)

SUST-001-autumn2022

Osallistujat

Anvoinnit

Welcome to the Sustainability Course

**Course instructions**

INTRO: Sustainability as a concept, the complexity of sustainability challenges, and systemic approach

SOLUTIONS to sustainability challenges

Registration for the project assignment

A: Global environmental commons

B: Human well-being and capabilities

C: Sustainable and just economies

## Sustainability Course SUST-001, autumn 2022

Katsaus kurssiestäni / Kursit / SUST-001-autumn2022 / Course instructions

Welcome to the Sustainability Course

**Course news forum**

SUST-001-autumn2022

Osallistujat

Welcome to the Sustainability Course

**Course instructions**

INTRO: Sustainability as a concept, the complexity of sustainability challenges, and systemic approach

SOLUTIONS to sustainability challenges

Registration for the project assignment

A: Global environmental commons

B: Human well-being and capabilities

C: Sustainable and just economies

D: Sustainable food systems and healthy nutrition

E: Climate Change and just energy transitions

F: Urban and peri-urban development

Please read the instructions below before starting the course. Course developers will be happy to hear your feedback on the learning materials. Welcome aboard!

**Questions and answers (Q&A) forum: ask anything about the course**

Instructions and schedule for the course

Please read these instructions before starting the course

**Course instructions and schedule**

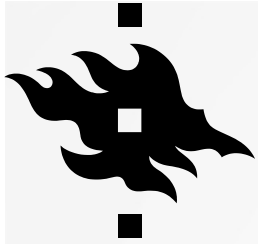
Instructions for the project assignment

Please read these instructions carefully before starting your project work.

**Project assignment instructions**

# LEARNING SUPPORT

- Teachers encourage students to take notes during the learning process.
- All the important news related to the course will be posted in the course front page “Course news forum”. Students are asked to follow this forum regularly.
- Students can also find a Questions and answers (Q&A) forum from the Course instructions -section.
- Teachers will organise optional help desk -sessions weekly in Zoom. The link can be found in the Course Instructions.
- Sustainability course has an optional Discord server for peer-to-peer-support, for instance asking quick questions about technical difficulties on the course platform and helping other students with their course-related-questions.



## POSSIBILITIES FOR IMPLEMENTING THE SUSTAINABILITY COURSE AT THE UNIVERSITY OF HELSINKI FOR DEGREE PROGRAMMES IN THE COMING CURRICULUM PERIOD (2023-2026)

- Degree programmes and faculties will have the opportunity to implement the course (SUST-001, 3 ects) in two ways:

- A) Synchronous, multidisciplinary collaborations with other degree programmes or faculties
- B) Centralized asynchronous self-study MOOC

Asynchronous course version will be developed during this academic year:

- Self-registration for the project assignment groups, more automated quizzes, translations for the assignments in Finnish and Swedish, instruction videos, learning materials for the university staff, new moodle-platform: [Digicampus.fi](https://digicampus.fi)

Page navigation

Please read the Course Instructions

# FRONT PAGE AND PROGRESS TRACKERS

The screenshot shows a Moodle course interface. At the top, the course title is 'Sustainability Course SUST-001, autumn 2022'. The left navigation menu includes items like 'Osallistajat', 'Welcome to the Sustainability Course', 'Course instructions', and various course modules. The main content area features a 'Welcome to the Sustainability Course' banner with a collage of sustainability-related images and a 'Course instructions' section containing a flowchart of the course structure. The right-hand side contains four progress tracking sections for mandatory assignments, each with a progress bar and a 'NYT' (Not Yet Turned In) indicator.

Progress trackers

Course News Forum

Page navigation

Please read the Course Instructions

MOODLE 3.11 KURSSIKATEGORIAT SUOMI (FI)

SUST-001-autumn2022

Osallistujat

Welcome to the Sustainability Course

**Course instructions**

INTRO: Sustainability as a concept, the complexity of sustainability challenges, and systemic approach

SOLUTIONS to sustainability challenges

Registration for the project assignment

A: Global environmental commons

B: Human well-being and capabilities

C: Sustainable and just economies

D: Sustainable food systems and healthy nutrition

E: Climate Change and just energy transitions

F: Urban and peri-urban development

Submitting and evaluating the project assignment and course feedback

Final registration

RAMI RATVIO OPISKELIJA

Ve hienon kurssin lohkon päälle tai näpöytä saadakseen lisätietoa.

Progress tracking of Project Assignment

NYT

Edistymisen: 0%

Ve hienon kurssin lohkon päälle tai näpöytä saadakseen lisätietoa.

Questions and answers (Q&A) forum: ask anything about the course

Instructions and schedule for the course

Please read these instructions before starting the course

Course instructions and schedule

Instructions for the project assignment

Please read these instructions carefully before starting your project work

Project assignment instructions

# COURSE INSTRUCTIONS

Course instructions –section includes:

- Questions & Answers forum,
- Course instructions and schedule,
- Project assignment instructions

Teachers  
-section

PREVIEW VERSION

Katsaus kurssiestani / Kurssit / TFS-SUST-001 / Teachers / Teacher's guide

## Teacher's guide

### 1. General information about the course

The University of Helsinki Sustainability Course (SUST-001) is a unique multidisciplinary course for all students of the University of Helsinki. It has been co-developed with over 160 members of the university community: students, teachers, researchers and other staff.

Sustainability Course aims to provide basic sustainability knowledge and skills that are needed for sustainability transformation and to tackle sustainability challenges. Please have a look at the introductory video of the course plan and general instructions in Autumn 2022.

Sustainability Course SUST-001 Course plan and general ...  
Kopioi linkki

**SUSTAINABILITY COURSE – KESTÄVYYSKURSSI**  
(SUSTECTS)  
COURSE PLAN AND GENERAL INSTRUCTIONS  
VERSION 2.0 ASIAN ELEPHANT

Katso: YouTube

HELSINKI UNIVERSITY OF TECHNOLOGY HYPE HELSUS

Online courses have been classified based on their scalability (large - small) and how they support collaborative and social learning activities (collaborative vs self study) (see Saadatmand 2017, image below). This Sustainability Course version aims to be a collaborative and scalable course, based on agile peer review such as comments on discussion boards and automatic assessment per quantity. In addition to that, the course contains many automated learning activities, such as Quizzes and optional H5P-based quick games.

#### Sisällysluettelo

1. General information about the course
  - 1.1. Course implementation options and duration
  - 1.2. Accessing the Sustainability Course in Moodle or setting up your own Sustainability Course
  - 1.3. Teacher's role
  - 1.4. Student's role
  - 1.5. Code of conduct and the safe space principles
2. Learning goals
3. Course content and structure
4. Example of a course schedule
5. Evaluation of Course Assignments and grading
6. Learning support
7. Teacher's tasks on the course
  - 7.1. Teacher's tasks before the start of the course
  - 7.2. Teachers' tasks during the course
  - 7.3. Teacher's task after the course
8. Tips for developing the course materials further
9. Teachers for Sustainability Network

#### Progress tracking of mandatory assignments (INTRO)

NYT

Edistymisen: 20%

Vie hiiren kursori lohkon päälle tai näpäytä saadaksesi lisätietoa.

# TEACHERS' GUIDE

Teachers-section includes materials for the Sustainability Course teacher:

- General information about the course
- Teachers' tasks and templates for the course events and student communication
- Tips for developing the course materials further

MOODLE 3.11 COURSE CATEGORIES ENGLISH (EN) RAMI RATVIO

SUST-001-autumn2022

Participants

Grades

Welcome to the Sustainability Course

Course instructions

**INTRO: Sustainability as a concept, the complexity of sustainability challenges, and systemic approach**

SOLUTIONS to sustainability challenges

Registration for the project assignment

A: Global environmental commons

B: Human well-being and capabilities


C: Sustainable and just economies

D: Sustainable food systems and healthy nutrition


E: Climate Change and just energy transitions


F: Urban and peri-urban development


Submitting and evaluating the project assignment and course feedback

 Fundamentals of Sustainability Mandatory Pre-Assignment

Before starting to study this module, please post your answer to the discussion forum below, and answer the short Quiz to agree on the Sustainability Course Code of conduct and Safe space principles.


 Code of conduct and Safe space principles  
Receive a grade Receive a pass grade


 MODULE 1, MANDATORY ASSIGNMENT 1: Introduction discussion: Your definition of sustainability  
Make forum posts: 2

 Book 1: Fundamentals of Sustainability

In this book, you will learn about:

- Background and development of the notions of sustainability
- Areas of opportunity for sustainability transitions
- A systems perspective to sustainability

 Book 1: Fundamentals of sustainability



Progress tracking of mandatory assignments (INTRO)

NOW

Progress: 20%

Mouse over or touch bar for info.

Overview of students

# EXAMPLE: INTRO- MODULE

- Click menu to access the module front page
- All the mandatory assignments and books are listed at the module front page
- Mandatory assignments can be accessed also from the Progress trackers
- Students can give a quick feedback in a short feedback survey after studying the module



## How can we promote sustainability transition?



Keskustelu ↓	Aloitettu:	Viimeisin viesti	Vastaukset	Tilaa
☆ Phosphorus cycle	Meri Mäk... 4 maalis 2021	Meri Mäkelä 4 maalis 2021	0	🔌
☆ Particle pollution of the atmosphere	Meri Mäk... 4 maalis 2021	Meri Mäkelä 4 maalis 2021	0	🔌
☆ Ozone depletion	Meri Mäk... 4 maalis 2021	Meri Mäkelä 4 maalis 2021	0	🔌
☆ Ocean acidification	Meri Mäk... 4 maalis 2021	Sini Laakso 21 maalis 2021	2	🔌
☆ Nitrogen cycle	Meri Mäk... 4 maalis 2021	Meri Mäkelä 4 maalis 2021	0	🔌
☆ Freshwater use	Meri Mäk... 4 maalis 2021	Carita Aapra... 20 maalis 2021	3	🔌

# INTRO-MODULE CONTENT AND ASSIGNMENT EXAMPLES

What do you see going on in these pictures? Identify and name the dynamics in these pictures.

Kolmiossa ihminen pitää itseään luomakunnan kruununna, jopa omaa rotuaan parempana kuin muut. Kaikki muu palvelee ihmistä. Ympyrässä ihminen on osa ympäristöstä, vastuussa ja riippuvainen siitä.

Antropocentric view and non-anthropocentric view

A man stands on top of all other beings that seem to have been placed in hierarchy of some sort. The

Ensimmäisessä (pyramidi) kuvassa ihminen kuvataan valta-asemassa muihin nähden (huomi nainen alempana.). Toisessa kuvassa ihminen on osa luontoa, jossa kaikki ovat yhteydessä kaikkeen ja kaikkiin (kuten oikeasti ovatkin).

Vasemmanpuoleisessa kuvassa ihminen (mies) on pyramidin huipulla. Oikeanpuoleisessa kuvassa ihminen on samalla tasolla muiden laojen kanssa.

Havainnollistetaan eri tapoja nähdä ihminen osana maailmaa ja ympäristöä.

Kolmiossa on ihmiskeskeinen käsitys maailmasta, jossa mies on naista arvokkaampi. Ihminen on nautanut itsensä muun luonnon yläpuolelle ja ulkoistanut itsensä siitä. Ympyrässä ihminen (niin mies kuin nainen) on laji muiden joukossa ja tasavertainen.

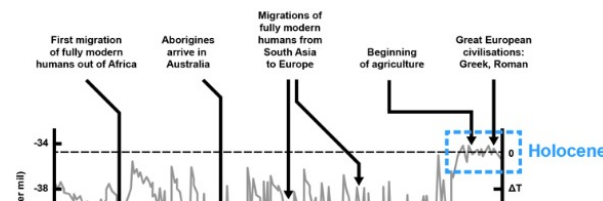
Näen kolmiossa sen vääristyneen

## 3. Concepts and approaches

By Jana Moritz and Michiru Nagatsu

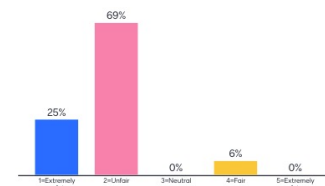
### From Holocene to Anthropocene

Throughout the existence of planet earth, there have been several glacial cycles. Humans and our ecosystems are only able to thrive in the interglacial periods. The current one, the Holocene, has been going on for 10000 years now (Figure 3). Within this period, complex systems, technologies and societies have evolved. Since the industrial revolution, humans are effectively pushing the planet outside the Holocene range. As most of recent climate change has been caused by human activities, scientists are discussing whether we started a new epoch, the Anthropocene. In the latest events of the Anthropocene, Rockström et al pose a new question: "What are the non-negotiable planetary preconditions that humanity needs to respect in order to avoid the risk of deleterious or even catastrophic environmental change at continental to global scales?" (2009).



1. Activating assignments (~1 / BOOK)
2. Assignments supporting the learning process (~3-5 / BOOK)
3. Assignments that will be evaluated (formative or summative) (~1/ BOOK)

Do you think it's fair to ask Sámi Indigenous peoples to make space for energy projects to produce close to zero carbon energy?

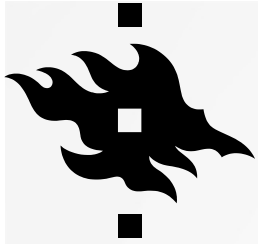


What should be sustained over time?

- Some concrete things, such as the number of 'native' species in a given location, regardless of its benefits to humans.
- Possibilities for humans, both current and future generations, to satisfy their preferences, whatever they may be.
- Some concrete things, such as critical natural capital that provides essential ecosystem services to humans.

Check

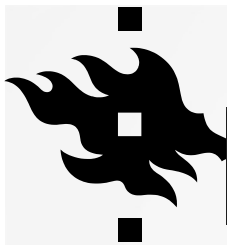




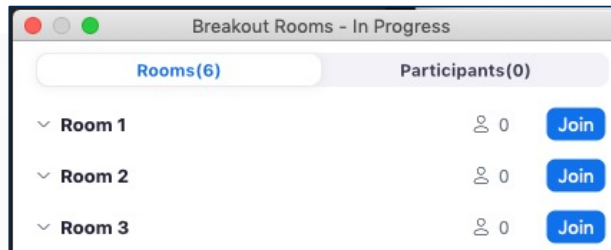
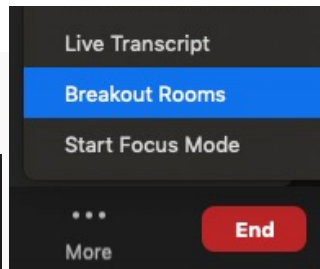
# GROUP DISCUSSIONS (9:40-10:15): ASSIGNMENTS IN THE INTRO-MODULE: STUDENTS' CONCEPT MAPS ON SUSTAINABILITY

- Join in one of the breakout rooms (opening soon).
- Analyze together students' concept maps about Sustainability, from the assignment **“MODULE 1, MANDATORY ASSIGNMENT 4: Mind map or Concept map”**
- Open the concept maps in Flinga: <https://edu.flinga.fi/s/EGRHWJT>
- Discuss the following questions. Write your answers in Flinga.
  - What kind of similarities or differences do you find in the concept maps? If you have time, discuss also the following questions:
    - How has the students' definition of sustainability changed during the intro-module (according to their self-evaluation)?
    - How are the students' concept maps compared to your own definition of sustainability?
    - What other assignment do you find in the Intro-module, that support the learning of sustainability as a concept, complexity of sustainability challenges and systemic approach?

The screenshot shows the Flinga messaging interface. At the top, there's a header with the Flinga logo, a search bar, and a 'Message' tab. The main content area displays a message containing two concept maps and two student reflections. The first concept map is a circular mind map with 'Sustainability' at the center, surrounded by terms like 'Economic', 'Social', 'Environmental', 'Cultural', and 'Political'. The second concept map is a more complex hierarchical diagram with 'Sustainability' at the top, branching into 'Economic', 'Social', 'Environmental', and 'Cultural', each with further sub-categories. Below the maps are two student reflections. Student 1 discusses the difficulty of defining sustainability and the need for a systemic approach. Student 2 reflects on how their definition of sustainability has evolved through the module, emphasizing the importance of a systemic and interdisciplinary approach.



Join in:



# SMALL GROUP DIVISION

## ROOM1 (EN)

Agnese	Bankovska
Sadia	Zafar
Aikaterini	Velentza
dorothee	cambou
Shuanghong jenny	Niu
Edith	Villa Galaviz
Staffan	Himmelroos

## ROOM2 (EN)

Sean	Morris
Riikka	Suhonen
silvia	gaiani
Banu	Turkmen
Meeri	Tiensuu
İsmail	Dönmez

## ROOM3 (EN)

Ghazale	Kordi
Salvatore	Ruggiero
Mohsen	Saadatmand
Li	Yuan
Mina	Zare
Marianna	Vivitsou
Inna	Sukhenko

## ROOM4 (FI)

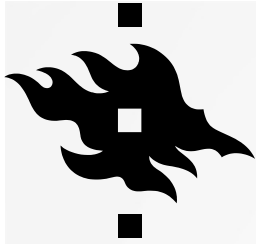
Staffan	Himmelroos
Tuija	Cornér
Reetta	Kivelä
Outi	Haatainen
Ilkka	Miettinen
Niklas	Jensen-Eriksen
Eija	Kaukonen

## ROOM5 (FI)

Elias	Hurmekoski
Heli	Kainulainen
Olli-Pekka	Penttinen
Mikaela	Grotenfelt-Enegren
Selja	Koponen
Jaana	Laine
Heini	Hult-Miekkavaara

## ROOM6 (FI)

Elina	Lehtonen
Talvikki	Ahonen
Jelena	Meinilä
Heidi	Rautionmaa
Kristiina	Patja
Anu	Laakkonen
Antti	Laherto

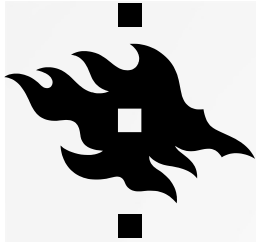


## SUMMARY: GROUPS' REFLECTIONS AND YOUR BEST PRACTICES IN SUSTAINABILITY EDUCATION

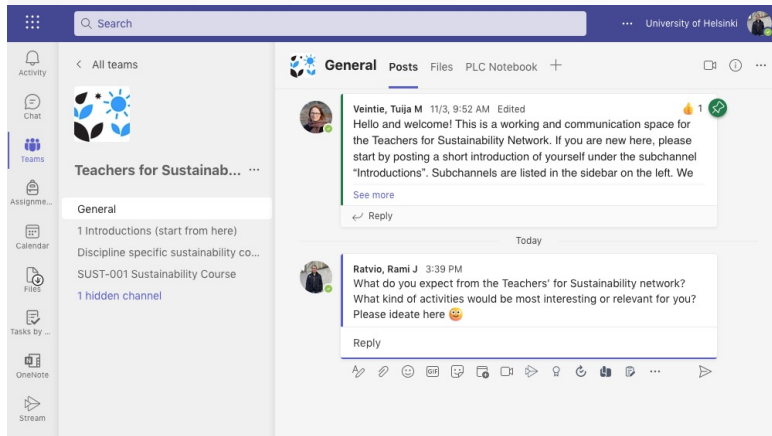
Analyzing students' concept maps about Sustainability, from the assignment “**MODULE 1, MANDATORY ASSIGNMENT 4: Mind map or Concept map**”

- Concept maps in Flinga: <https://edu.flinga.fi/s/EGRHWJT>
  - What kind of similarities or differences did you find in the concept maps?
  - How has the students' definition of sustainability changed during the intro-module (according to their self-evaluation)?
  - How are the students' concept maps compared to your own definition of sustainability?
  - What other assignment did you find in the Intro-module, that support the learning of sustainability as a concept, complexity of sustainability challenges and systemic approach?

(Master's thesis (forthcoming): Kettunen, Paavo. Käsitteellinen muutos yliopiston Kestävyyskurssilla. ECGS. Helsingin yliopisto.)



# SUMMARY: GROUPS' REFLECTIONS AND YOUR BEST PRACTICES IN SUSTAINABILITY EDUCATION



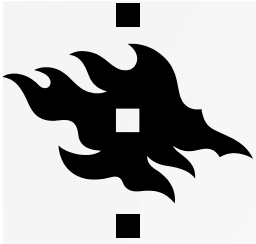
- What kind of learning materials, methods or course examples etc. would you like to share on sustainability education?
- What kind of activities or forms of support do you need, or what kind of ideas do you have on how could we work together to develop the Teachers for Sustainability network, share knowledge, experience and peer-support?
- Please continue the discussion and share your comments in Teachers for Sustainability –Teams: [https://bit.ly/TfS\\_Teamsgroup](https://bit.ly/TfS_Teamsgroup)



# NEW VIDEOS IN UNI HELSINKI YOUTUBE: SYSTEMIC THINKING, FUTURES THINKING, STRATEGIC THINKING AND AGENCY IN UNIVERSITY TEACHING

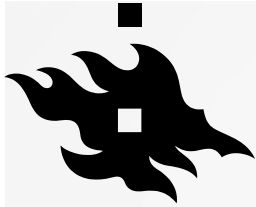
<https://blogs.helsinki.fi/uhsustained/>





# NEXT WORKSHOPS

- 9.12.2022, 12:15-13:45 Työpaja 2: Yleisestä kestävyyskurssista (SUST-001) tieteenalakohtaiseen (SUST-002) / Workshop 2: From general to discipline-specific sustainability course (from SUST-001 to SUST-002)
- 14.12.2022, 12:15-13:45 Työpaja 3: Kokemuksia tieteenalakohtaisten kestävyyskurssien (SUST-002) kehittämisestä eri tiedekunnissa / Workshop 3: Snapshots of developing discipline-specific courses (SUST-002) in different faculties
- Registration: <https://elomake.helsinki.fi/lomakkeet/120067/lomake.html>



# REFERENCES / LITERATURE

Bosman, H. P. A., Gruber, H. & Strasser, J. (2020). Knowledge restructuring through case processing: The key to generalise expertise development theory across domains? *Educational Research Review*, 29, Article 100310.

Brundiers, K., Barth, M., Cebrián, G., Cohen, M., Diaz, L., Doucette-Remington, S., Dripps, W., Habron, G., Harré, N., Jarchow, M., Losch, K., Michel, J., Mochizuki, Y., Dieckmann, M., Parnell, R., Walker, P. & Zint, M. (2020). Key competencies in sustainability in higher education—toward an agreed-upon reference framework. *Sustainability Science*, 16, 13–29 (2021). <https://link.springer.com/article/10.1007/s11625-020-00838-2>

Heijltjes, A., Tamara van Gog, T., Leppink, J. & Paas, F. 2014. Improving critical think-ing: Effects of dispositions and instructions on economics students' reasoning skills. *Learning and Instruction* 29, 31–42

Kestävyyspaneeli (2020). Kuusi polkua kestävyteen: evästyksen systemisen kestävyysmurroksen edistämiseksi Suomessa. Kestävyyspaneelin julkaisu 1/2020. [https://www.kestavyyspaneeli.fi/wp-content/uploads/sites/41/2020/02/Kuusi-polkua-kestavyteen\\_julkaisu2020.pdf](https://www.kestavyyspaneeli.fi/wp-content/uploads/sites/41/2020/02/Kuusi-polkua-kestavyteen_julkaisu2020.pdf)

Lozano, R., Merrill, M. Y., Sammalisto, K., Ceulemans, K. & Lozano, F. J. (2017). Connecting Competences and Pedagogical Approaches for Sustainable Development in Higher Education: A Literature Review and Framework Proposal. *Sustainability* 2017, 9, 1889; doi:10.3390/su9101889 <https://www.mdpi.com/2071-1050/9/10/1889>

Muukkonen, H., Lakkala, M. Lahti-Nuutila, P., Ilomäki, L. Karlgren, K. & Toom, A. (2019). Assessing the development of collaborative knowledge work competence: Scales for higher education course contexts. *Scandinavian Journal of Educational Research*. DOI: <https://doi.org/10.1080/00313831.2019.1647284>.

Soini, K. (2017). Kestävyytiede – kestävyystutkimuksen uusi paradigma?. *Tieteessä Tapahtuu*, 35(1). Noudettu osoitteesta <https://journal.fi/tt/article/view/60788>

Tuononen, T., Hyytinen, H., Kleemola, K., Hailikari, T., Männikkö, I. & Toom, A (2022). Systematic review of learning generic skills in higher education - enhancing and impeding factors. *Frontiers in Education*.

Tuononen, T., Parpala, A. & Lindblom-Ylänne, S. 2019. Graduates' evaluations of usefulness of university education, and early career success—a longitudinal study of the transition to working life. *Assessment & Evaluation in Higher Education*, 1–14.

Wiek, A., Bernstein, M. J., Foley, R. W., Cohen, M., Forrest, N., Kuzdas, C., Kay, B., Withycombe Keeler, L. (2016). Operationalising competencies in higher education for sustainable development. Teoksessa Barth, M., Michelsen, G., Rieckmann, M. & I. Thomas (toim.) *Routledge Handbook of Higher Education for Sustainable Development*, 241–260. Routledge. [https://www.researchgate.net/publication/283295405\\_Wiek\\_A\\_Bernstein\\_MJ\\_Foley\\_RW\\_Cohen\\_M\\_Forrest\\_N\\_Kuzdas\\_C\\_Kay\\_B\\_Withycombe\\_Keeler\\_L\\_2016\\_Operationalising\\_Competencies\\_in\\_Higher\\_Education\\_for\\_Sustainable\\_Development\\_In\\_Barth\\_M\\_Michelsen\\_G\\_Rieckmann\\_M](https://www.researchgate.net/publication/283295405_Wiek_A_Bernstein_MJ_Foley_RW_Cohen_M_Forrest_N_Kuzdas_C_Kay_B_Withycombe_Keeler_L_2016_Operationalising_Competencies_in_Higher_Education_for_Sustainable_Development_In_Barth_M_Michelsen_G_Rieckmann_M)

Wiek, A., Withycombe, L. & C. L. Redman (2011). Key competencies in sustainability: A reference framework for academic program development. *Sustainability* 2011, 3, 218. <https://link.springer.com/article/10.1007/s11625-011-0132-6>