



Aalto University
School of Engineering

Sustainability in Environmental Engineering

WAT - E2140

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28 Oct 2020

Agenda for today

Course practicalities

- Online environment
- Intended learning outcomes
- Timetable of course topics and tasks
- Key contents and teaching methods
- Workload

Small exercise

Break

Introduction to Concept map Assignment

Introducing Article tasks I and II

Homework for Friday

Online practicalities

1. Zoom: for teaching sessions

- Activate your Aalto Zoom license (see MyCourses for details)
- Recoding all the teaching sessions
 - *Will be available in MyCourses (only for course participants)*
- Microphones muted when not speaking, Cameras on, at least in breakout rooms
- Chat can also be used for questions
 - *Note: the one who is presenting may not notice, so please, be brave to also turn on your microphone!*
- Whiteboard in active use: View options → annotate

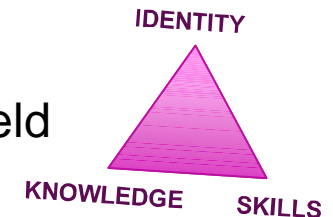
2. Teams: channel for asking for help & support

- Join the course Teams, see MyCourses for details

Your intended learning outcomes

After the course you should be able to:

- define the concept of sustainability and understand the scientific, political, regulative and societal frameworks relating to its implementation [knowledge]
- describe the principles of different types of methods and measures that can be used to assess sustainability and recognize their differences and limitations [knowledge]
- apply selected method(s) used in sustainability assessment [skill]
- promote sustainable development in the society through your own field [identity]
- recognize your own strengths and weaknesses in group working [identity]



Overview of the contents

❖ **Background: Concepts and frameworks**

- Sustainability as a concept
- Sustainability science & policy

❖ **Sustainability appraisal (= methods)**

- Overall understanding on existing engineering methods
- Life Cycle Assessment LCA:
 - *production- & consumption-based assessment, rebound, life cycle thinking & value chains*
- Environmental Impact Assessment EIA

❖ **Communication and societal impact of sustainability appraisal**

- Corporate responsibility

Timetable: Topics and tasks

Week	1		2		3		4		5		6	
Day	Wed 28.10.	Fri 30.10.	Wed 4.11.	Fri 6.11.	Wed 11.11.	Fri 13.11.	Wed 18.11.	Fri 20.11.	Wed 25.11.	Fri 27.11.	Wed 2.12.	Fri 4.12.
Topics and tasks	Frameworks Task 1, DL 6.11											
	Concept map assignment (individual): 1st DL 18.11. (tutoring), final DL 14.12.											
			Measuring SD Task 2, DL 10.11.									
					Implementation: LCA Task 3, DL 17.11.							
							Pre-reading		Implementation: EIA Task 4, DL 27.11.			
							Concept map tutoring!		Societal impact Task 5, DL 4.12.		Final seminar	
<p>Course intended learning outcomes (ILOs):</p> <ol style="list-style-type: none"> 1. define the concept of sustainability and understand the scientific, political, regulative and societal frameworks relating to its implementation [knowledge] 2. describe the principles of different types of methods and measures that can be used to assess sustainability and recognize their differences and limitations [knowledge] 3. apply selected method(s) used in sustainability assessment [skill] 4. promote sustainable development in the society through his/her own field [identity] 5. recognize his/her own strengths and weaknesses in group working [identity] 												

Teaching methods

The course applies student-centered and outcomes-based teaching and learning = the tasks are planned to address the course intended learning outcomes, and the assessment is based on how well you perform in those.

The course comprises:

Contact sessions (lectures, group tasks, reflective discussions)

- *non-compulsory but strongly recommended due to the participatory teaching methods (you also get points from attending the sessions)!*

Individual tasks

- *total number 2: Task 1 + Concept Map*

Group assignments

- *total number 4: Tasks 2-5 (Task 4 EIA has an individual part, 25% of the grade)*

Seminar

- *Compulsory (part of one task), Fri 4.12.2020*

Workload and Grading of the course: Weighing of the Tasks & Teaching sessions

Workload in 7 weeks in total = ~135 hours (19-20 hrs/week):

Working hours per week: 5-7hrs contact sessions + 3-5hrs concept map work (= reflection & deep learning)
+ 5-10hrs other independent or group work.

The grading of the course: the total amount of points from all the learning assignments + contact session attendance. Submission overdue = -25% points / submission. To pass the course, you need to submit all the tasks and assignments by Monday 14h Dec 2020 at 23.55.

Grading: 0-49 points = Fail; 50-60 = 1; 61-70 = 2; 71-80 = 3; 81-90 = 4; 91-100 = 5.

- ❖ **Concept map assignment**, Individual = max 20p. (~25 hrs)
- ❖ **Task 1:** SD Science & Policies, Learning diary, Individual = max 8p. (~7 hrs)
- ❖ **Task 2:** Measuring sustainability, Presentation and reflection, Group = max 8p. (~7 hrs)
- ❖ **Task 3:** LCA/Rebound, Calculations & brochure, Group = max 10p. (~10 hrs)
- ❖ **Task 4:** EIA, Quiz (individual) & Presentation, Group = max 14 p.(~15 hrs)
- ❖ **Task 5:** Corporate responsibility, Sustainability evaluations, Group = max 10 p.(~10 hrs)
- ❖ **Contact sessions (10):** 2 points / attendance (Aalto feedback extra 2p.) = max 20p. (+2)(~25 hrs)
- ❖ **Peer and self assessment** = max 10p.

Compensatory tasks

If you attend only a part (~50%) of a contact session, you can get 1p.

In case you need to be absent from a contact session, you can still get the 2 points by doing **a compensatory task**.

How?

- Ask Meeri for a compensatory task by email
- Submit your task to MyCourses Discussion Forum:
<https://mycourses.aalto.fi/mod/forum/view.php?id=639017&forceview=1>

If you are absent, please note: it is your responsibility to find out what to do next, or how a group task should be done.

Peer and self assessment

Many hours of the course work is done in groups.

Group work is included in the intended learning outcomes of the course.

→ Group work ought to be assessed, too!

Will be done in the end of the course, during 7th-11th December through a Webropol survey:

- a. Content 1-5 (5p. – 25p.)
- b. Interaction 1-5 (5p. – 25p.)
- Final grade = avrg (a,b)

Exercise



Individually (5 min):

- 1) What is sustainability?
- 2) What is environmental engineering?
- 3) What expectations you have of the course?

In groups (15 min)



Discuss in your breakout rooms, based on your individual reflections, and create your groups' common view on:

- 1) What is sustainability?
 - 2) What is environmental engineering?
 - 3) List 2-3 key expectations your group has of the course
- Remember also to introduce yourselves to each other!

→ Prepare to share your thoughts with others!

Sustainability?

Improve relationship between human activities and nature

Sustain the world for future generations

Ecocentric view → Nature has absolute value as well, not only economic

Sustainability means using resources in a balanced way so that they are also available for future generations.

Brundtland (?) report definition

-four pillars: economical, ecological, cultural and societal. Next generation should have access to same resources

The use of resources by taking into account the ecological, economical, cultural and societal impacts so that the next generation has the access to at least the same amount of resources

Env. eng.?

Minimizing risks

Finding solutions to decrease our environmental impacts

A field of study where the environmental impacts and problems are assessed, evaluated and solved by the methods of engineering

Environmental engineering means finding practical solutions to existing environmental concerns.

A generalist to ensure every field is doing their best to ensure environmental quality

Topics include recycling, waste disposal, public health, water and air pollution control

Expectations

learn more about LCA methods

Course expectations - broader view on sustainability issues around the world (clear picture what sustainability is); learn to apply LCA for different processes

1) methods (LCA, EIA)
2) More knowledge about sustainability

Learn more about the legislation

1. Right approach to action
2. Techniques (LCA, EIA)

-legislations, legal framework, how to use

15 min break

Concept Map Assignment

Your task is to construct a descriptive concept map answering the following focus question:

What is sustainability in environmental engineering?

1. A compulsory mid-check and tutoring session on Wed 18th Nov.
 - *Make sure you have your preliminary map available and prepare to discuss your reflection process and procedures with your peers and me.*
2. Final DL Monday 14th December at 23.55.

Submission and instructions in MyCourses:

<https://mycourses.aalto.fi/mod/assign/view.php?id=639010>

Recommended reading in
Mycourses:
The Theory Underlying
Concept Maps

About concept maps

A concept map is:

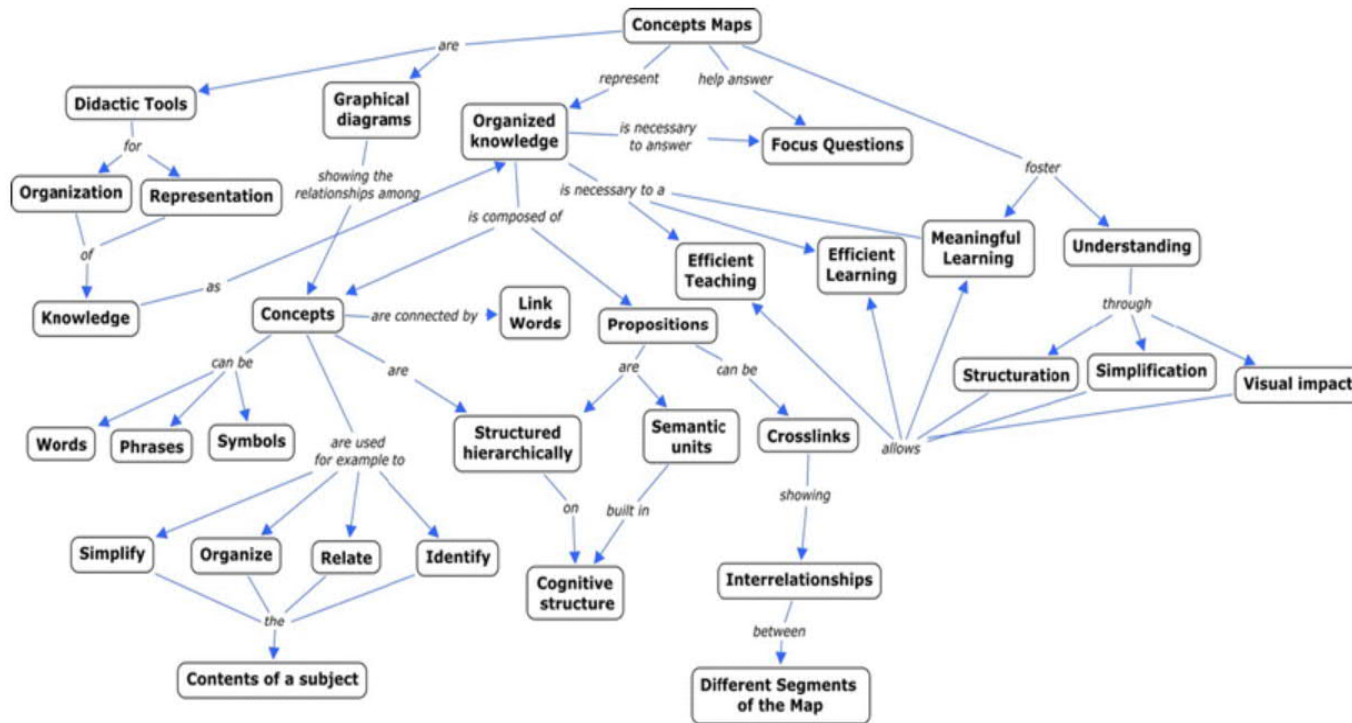
- A hierarchical, graphical presentation
- Two-dimensional, node-linked diagram that represents conceptual knowledge in a concise visual form

A descriptive concept map helps to resolve the focus question. Descriptive = there is no “correct version”, allows generating own views and conceptions.

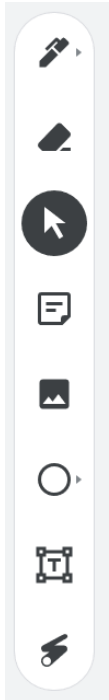
For a good and comprehensive concept map you need:

1. Concepts that are most central for answering the question
2. Organization of the concepts according to how well they correspond to your purposes
3. Visualization of the concepts in a way that clearly reveals the relationships between them
4. Arrows to illustrate how the concepts relate to each other in your own logical thinking (if you try to indicate all the relationships, the map will most probably become quite messy -> the idea is to point out the substantive relationships and highlight those)
5. Propositions, which comprise of two or a few concepts and the connecting arrows and word(s). Propositions can be true or false, convincing or unconvincing, and they can be also cross-relationship lines (creation leaps) between the concepts, and between different knowledge domains/segments

About concept maps



Let's practice!



A concept map with a title “DOG”

1. In groups: Write concepts that relate to dogs in Jamboard post-its (each in a separate post-it).
 - https://jamboard.google.com/d/11HWQ4v7e7oZp6NSnWOSOFbBEzBVwRCUqvpmmaioRH_s/edit?usp=sharing
2. Try to group the concepts under a few main titles.
3. Organise your titles and related concepts with connecting arrows and words -> they become readable propositions.
4. Try to find one connection between different knowledge segments or concepts → a creation leap

Break 5 min

About the task

The purpose: to facilitate your reflection process throughout the course = deepen your learning, and to have a concrete document on your learning outcomes

The data: all the contact sessions, tasks and assignments, and reading materials = your personal learning outcome from all the teaching activities and materials

The tool to use: for you to choose: can be e.g. hand-drawn, constructed with a specific concept map-software (e.g. Cmap), Word or PowerPoint, or with sticky notes in a large paper

The reflective thinking process behind a comprehensive concept map can be compared to that of an essay, meaning hours of active reflection = START REFLECTING NOW: Write down important concepts from contact sessions and tasks, and reflect what you learned from those: were they new for you, how they connect to your previous knowledge, how they are interlinked etc. Start also to plan how you will construct your map.

Submit the concept map through the MyCourses submission link. If you decide to hand-draw your map, submit a clear picture of it. Make sure the file you submit is readable and not e.g. too fuzzy.

Article tasks 1 and 2

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Article task I: SD Science and policies, ~7hrs

1) You will read 1 article for Fri 30th Oct. Find your own article in MyCourses under Task 1 according to your surname.

- Prepare to discuss on the article and teach the main content of it to others - read it carefully and take notes for yourself for the discussion.

Some guiding questions:

- What is the purpose of the paper (why it has been written)?
 - What is the framework and background of the paper?
 - What is the main message/outcome of the paper?
 - What kind of arguments/material the author(s) present to justify their key message(s)?
 - Who has written the paper?
 - To whom the paper is targeted to?
 - Would you define the paper as contributing to sustainability science or policies, or both? Why?
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Article task I: SD Science and policies, ~7hrs

2) Write a reflective learning diary based on your own article AND what you learned from the other articles + lecture on Fri 30th Oct.

DL for the diary is Friday 6th Nov at 23.55.

We'll get back to the diary instructions on Friday.

Key learning objectives of the task:

- To get a holistic overview of the scientific discourse around planetary situation and of the political measures to implement sustainable development
- To learn finding and communicating the key contents of the material given to you
- To learn reflective thinking: combining your previous knowledge to new information, analyzing your own learning process, learning to know yourself

Article task II: Measuring sustainability

- 1) Read the article appointed to your group
- 2) With your group, prepare to present your paper and teach the method to others on Fri 6th Nov. After the presentation, discuss and write a group reflection on your learnings. Final DL 10th Oct.

More information on Friday.

Key learning objectives of the task:

- To learn how sustainability can be evaluated and promoted through engineering methods
- To understand the possible uncertainties and limitations of the methods
- To learn communicating key messages clearly

To summarize

- 1) **Read your own Article task I paper for Friday so that you can teach it.**
- 2) **Forget about all the other parts of Tasks I and II until Friday noon ;)**
- 3) **Answer the Webropol survey (pre-assignment), it takes 5 minutes.**

You'll find all the instructions in MyCourses under each task and assignment.

See you on Friday!