Technology Dynamics MOT113a

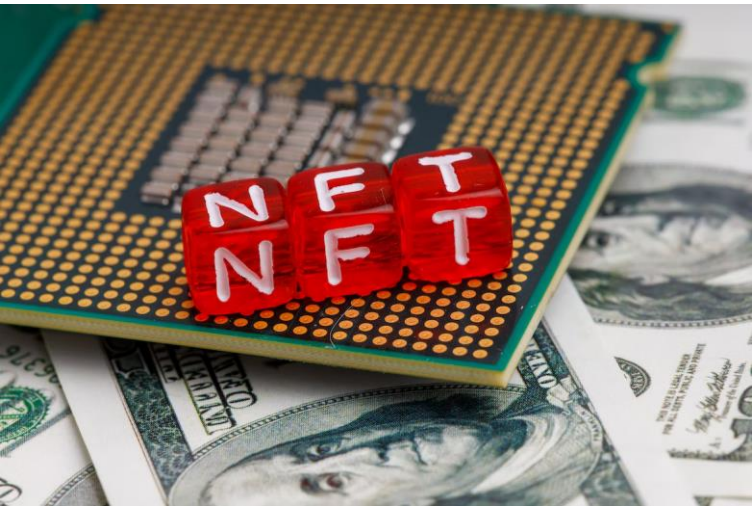
Workshop I INTRO

April 26th, 2024

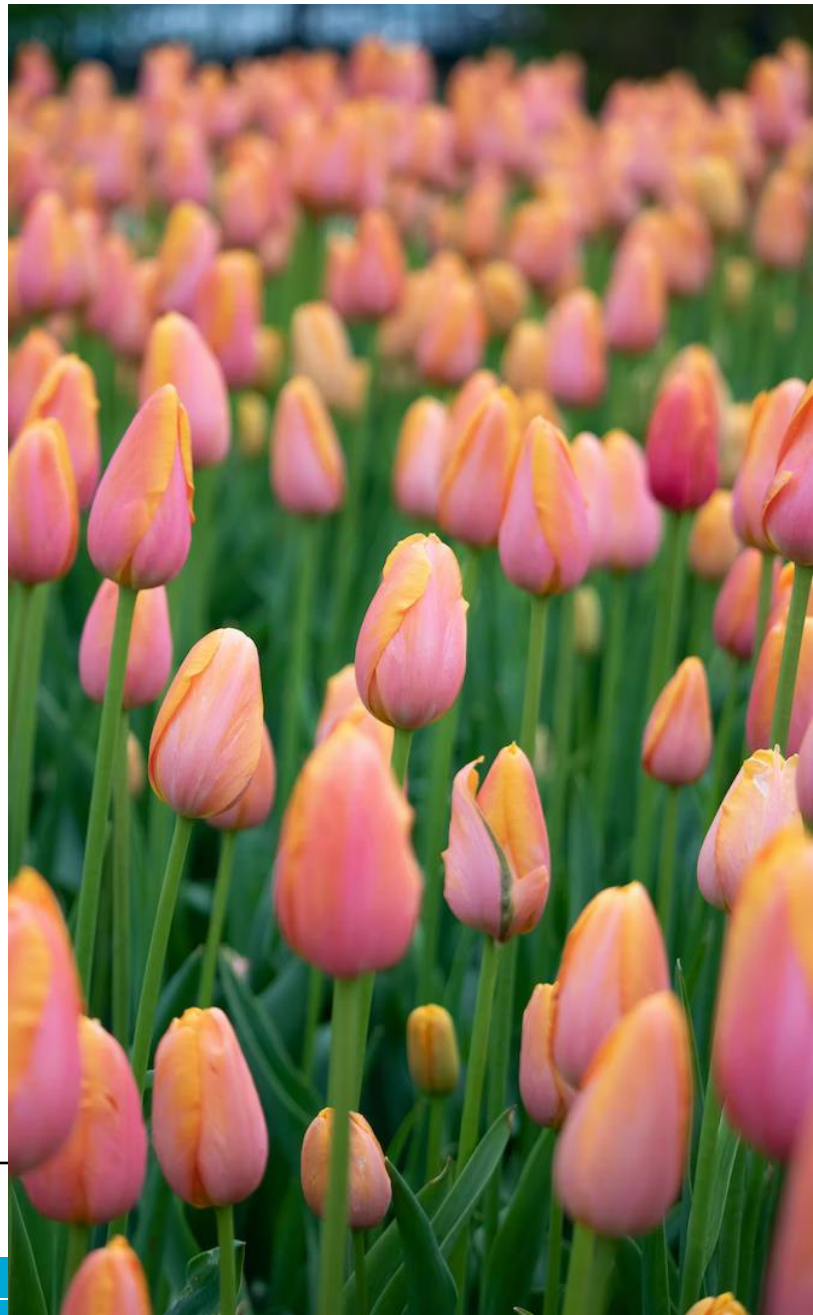
Dr. Claudia Werker

Non-fungible tokens: economic value?

https://video.twimg.com/ext_tw_video/1565500939057905664/pu/vid/720x720/0I9L6cekME5_2o_p.mp4?tag=12



https://www.youtube.com/watch?v=XsGOQP-B0gU&t=1712s



Workshop I INTRO

Getting to know each other

0. Resp. innovation and the 4th Industrial Revolution

Course Overview

1. Innovation: Concept and measurement

Information, (blended) learning and assessment

Introduction of exercises for groups work this afternoon

Forming groups

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Getting to know each other I

Getting to know each other II

Getting to know each other III

In what area do you hold a Bachelor degree?

- Architecture or Industrial Design
- Engineering or Computer Sciences
- Applied Sciences or Physics
- Others

Getting to know each other IV

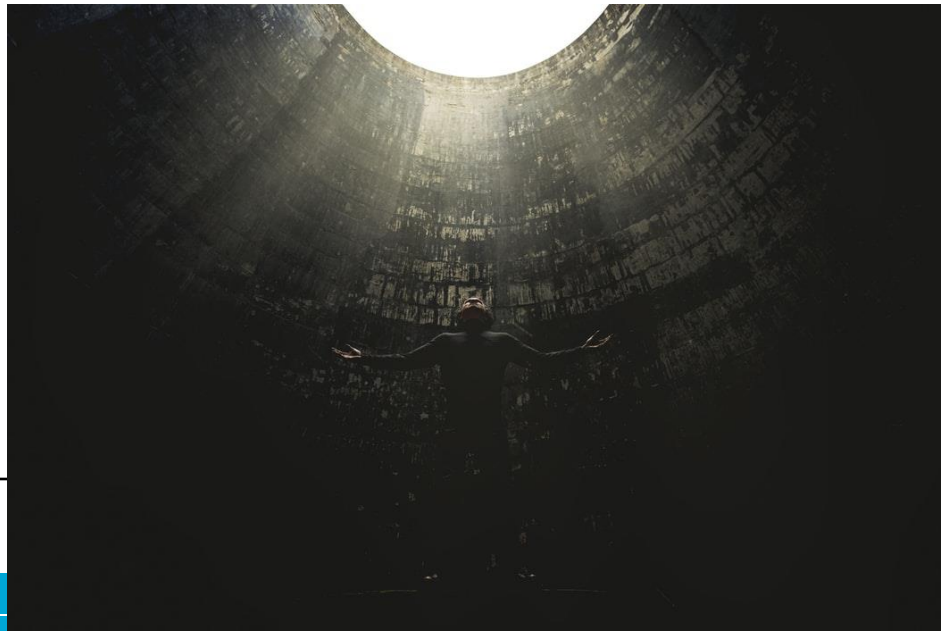
Where did you get your Bachelor degree?

- In the Netherlands or Europe
- In Asia
- In North- or South America or in Australia/New-Zealand

Getting to know each other V

What do you expect to learn in this course?

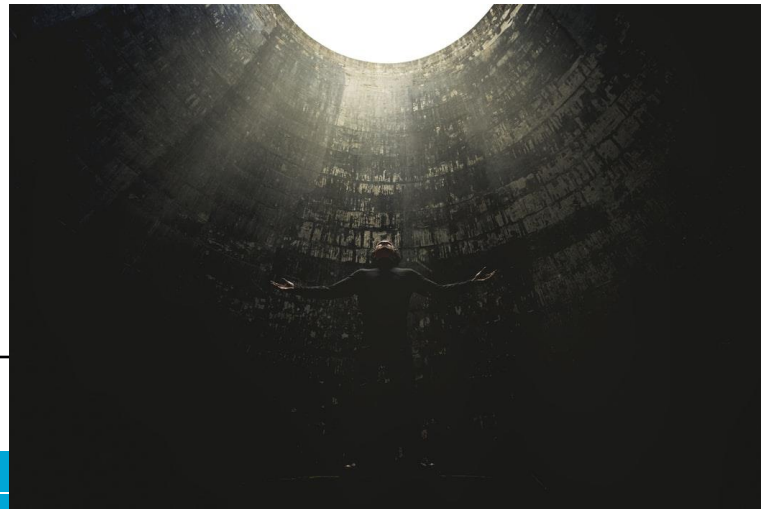
- Contents
- Skills
- Others, please specify



Getting to know each other VI

What do expect to learn in this course?

- Content:
  - Technology Dynamics
  - assess technology from an interdisciplinary economical and ethical perspective
- Skills:
  - read scientific papers
  - write up answers to academic research questions and present them
  - collaborate in a group (chairing etc.)
- Others



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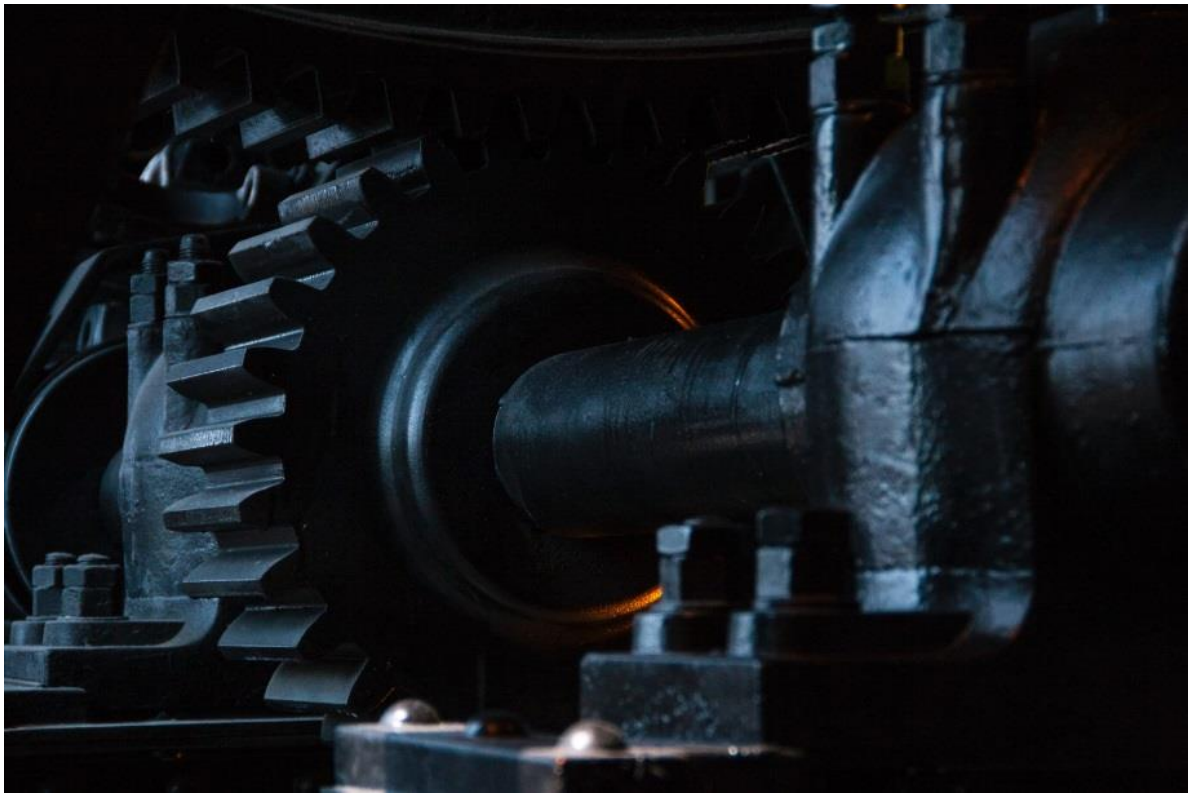
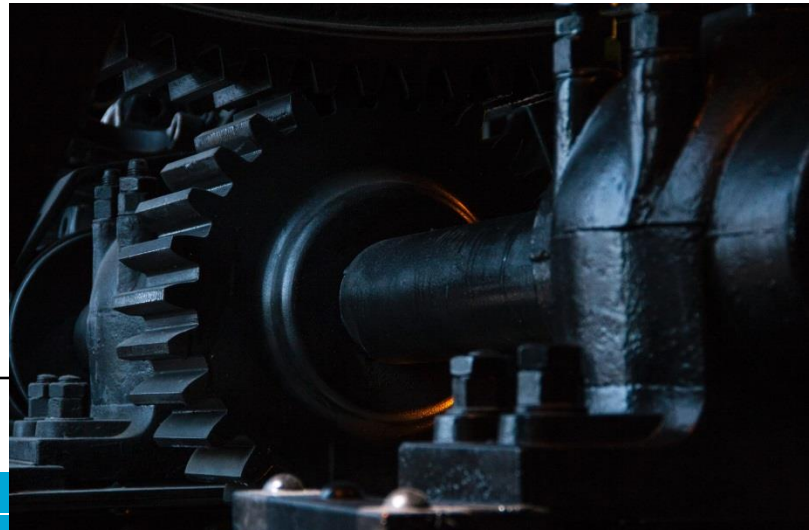
0.1 The 4th Industrial Revolution I



0.1 The 4th Industrial Revolution II

- 1st industrial revolution (end 18h century), trigged by the water- and steam-powered mechanical manufacturing

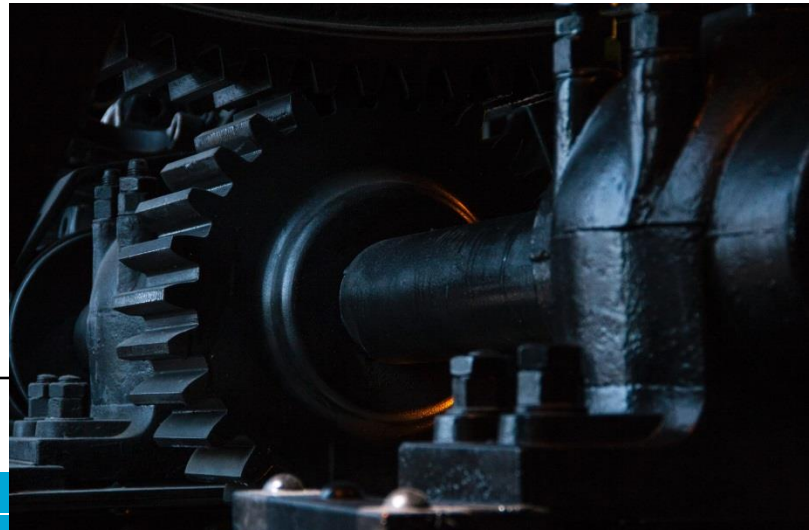
- 2nd industrial revolution (beginning of 20th century), driven by mass manufacturing



0.1 The 4th Industrial Revolution III

- 3rd industrial revolution (1970s), emerged from the introduction of programmable logic controllers (PLC) for automation purposes in manufacturing

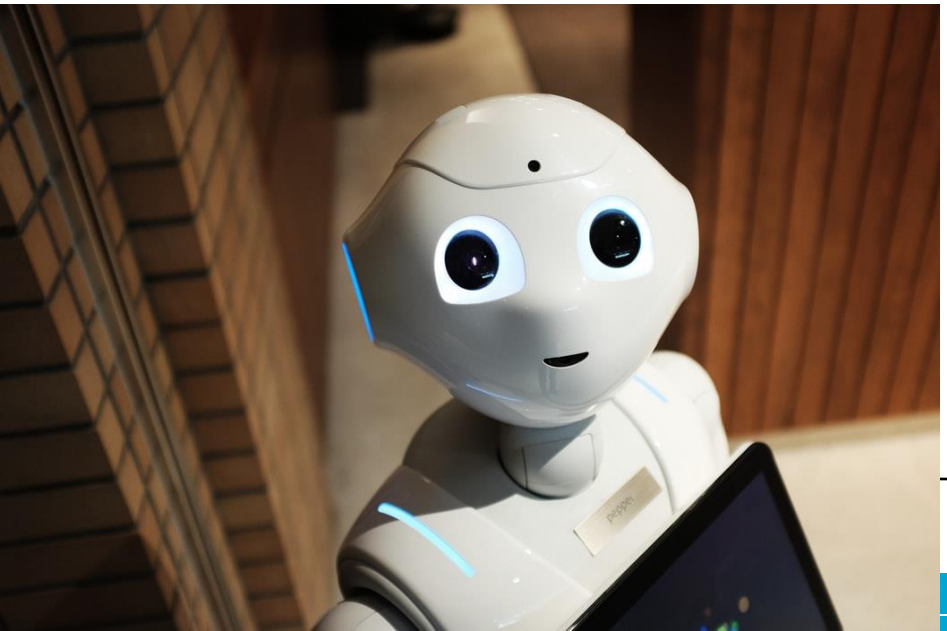
- 4th upcoming industrial revolution, set off by the internet allowing human-machine interaction throughout large networks



0.2 Responsible Innovation I

Conceptually:

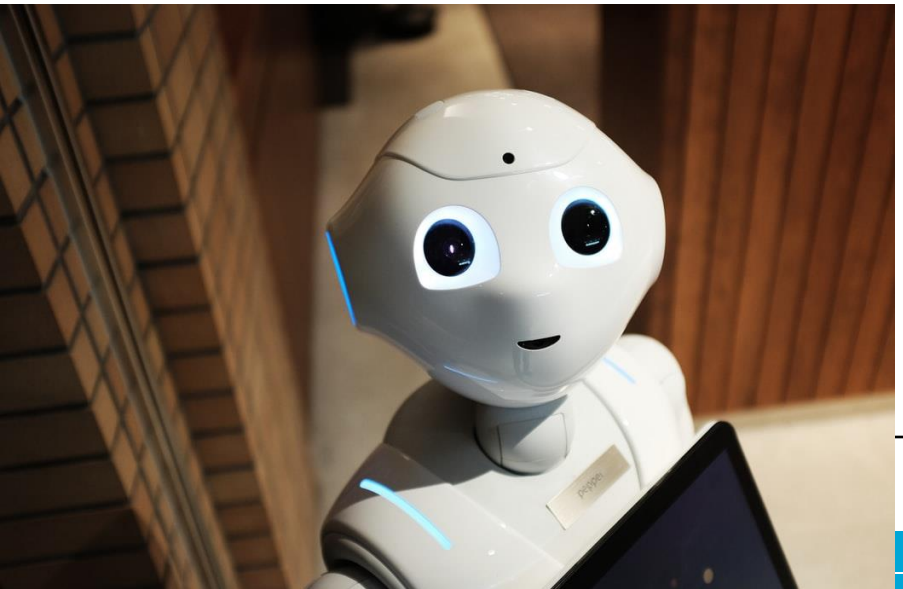
- employing and exploiting the potential of science, technology and innovation
- by incorporating values, i.e. “things worth striving for” (Taebi et al., 2014, p. 119), societal needs and economic opportunities



0.2 Responsible Innovation II

In practical terms:

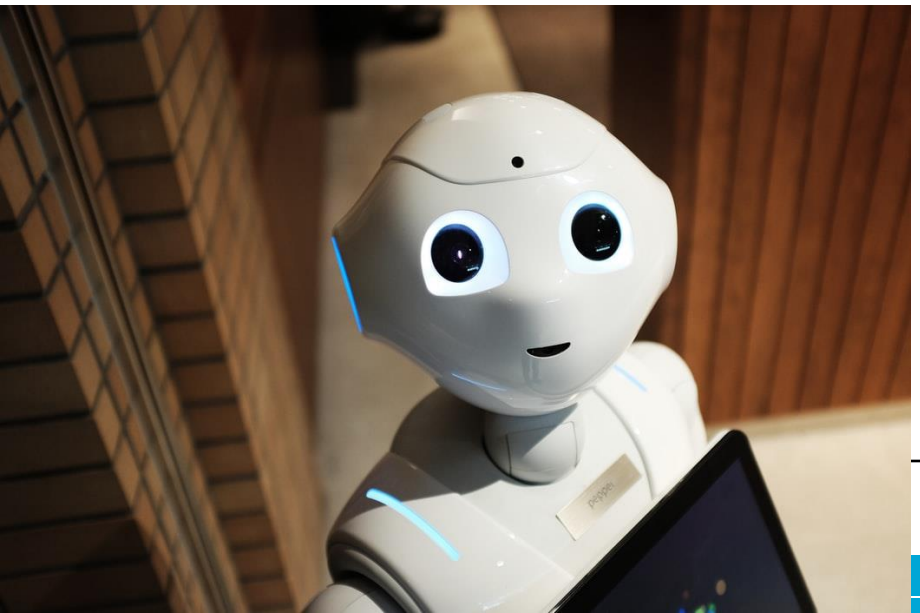
- consider contextual factors of a firm, a technological sector or a geographical area
- bottom-up approach: individual innovative agents develop shared values and joint activities
- top-down approach: groups of innovative agents contribute to monitoring, open-end experimentation, trust-building and legitimization



0.3 Responsible Innovation and 4th Industrial Revolution

Core of this course:

- analyzing innovation and technological development
- as part the fourth industrial revolution
- by a combination of economic (Economics of Technology and Innovation) and ethical approaches (Responsible Research and Innovation)



Skill: Quick Reading

- Become familiar with the source
  - read the abstract
  - skim the section headings
  - skim the bibliography
- Locate the point of the argument, i.e. the main claim
  - read introduction and conclusion
  - write down the problem and its resolution
  - find the evidence supporting the main claim
- If necessary identify sub-claims
- Identify key concepts
- Determine whether you need to read the paper as a whole or in part.

Source: Booth et al. (1995): The Craft of Research, p 82

Example: Quick Reading

van de Poel, I., Asveld, L., Flipse, S., Klaassen, P., Scholten, V., & Yaghmaei, E. (2017). Company Strategies for Responsible Research and Innovation (RRI): A Conceptual Model. Sustainability, 9(11), https://www.mdpi.com/2071-1050/9/11/2045/htm

Workshop I INTRO

Getting to know each other

0. Resp. innovation and the 4th Industrial Revolution

Course Overview

1. Innovation: Concept and measurement

Information, (blended) learning and assessment

Introduction of exercises for groups work this afternoon

Forming groups

Course Overview I: Content

0. Responsible innovation and the 4th industrial revolution
1. Innovation: Concepts and Measuresment
2. Innovation Systems and Proximity
3. Technological and Sectorial Innovation Systems
4. Geographical Innovation Systems
5. Responsible Research and Innovation (RRI)
6. RRI Systems
7. Inclusive Research and Innovation (IRI) in STEM

Course Overview II: From traditional teaching to independent learning

Work-shop	Ch	Teaching style	Skills
I	0/1	Traditional lecture (TL) and groups‘ work (GW)	Organizing and leading a group; quick read material
II	2	TL and GW, 2.1 blended lear-ning/flipped classroom (B/F)	See above, presentations and discussions, case studies, citing
II	3	B/F+, i.e. introduced briefly by the professor, and GW	See all of the above
II	4/5	B/F by lecturer and GW	See all of the above
III	trial	Trial exam I and assessment	Writing and assessing exam
III	6/7	B/F+ and GW	See all of the above
IV	trial	Trial exam II and assessment	Writing and assessing exam
IV	7	GW	See all of the above
IV	Q&A	Questions prepared by stud	answering exam questions

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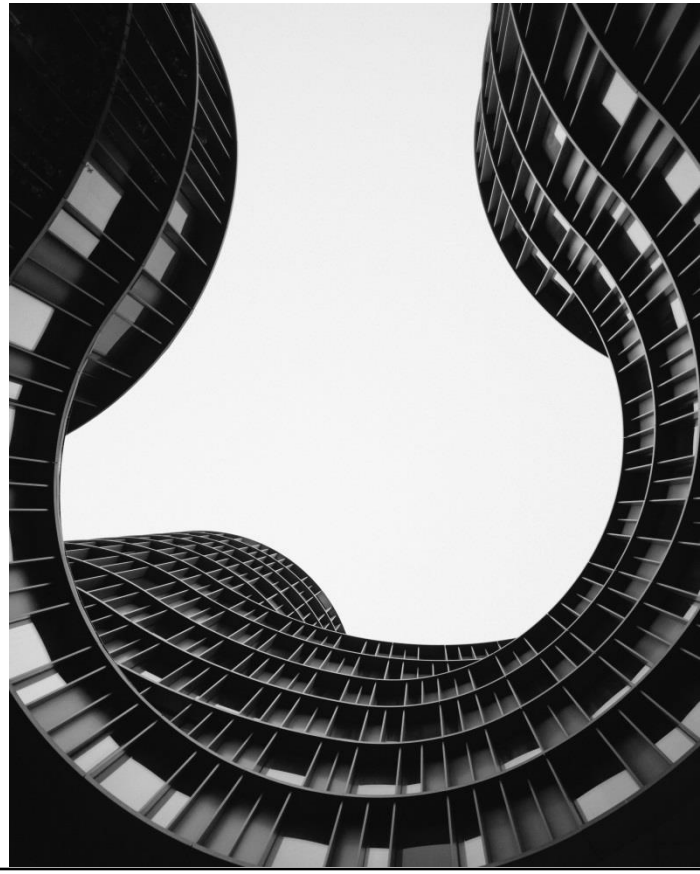
Learning Goals: Chapter 1

- define innovation
- recognize and identify different types of innovation
- characterize different kinds of innovation indicators
- explain their advantages and disadvantages
- critically assess the use of innovation indicators
- read texts using speedy reading
- use references according to the standards of social sciences

1. Innovation: Concept and Measurement

1.1 The Concept of Innovation

1.2 Innovation Indicators: measuring innovation



1. Innovation: Concept and Measurement

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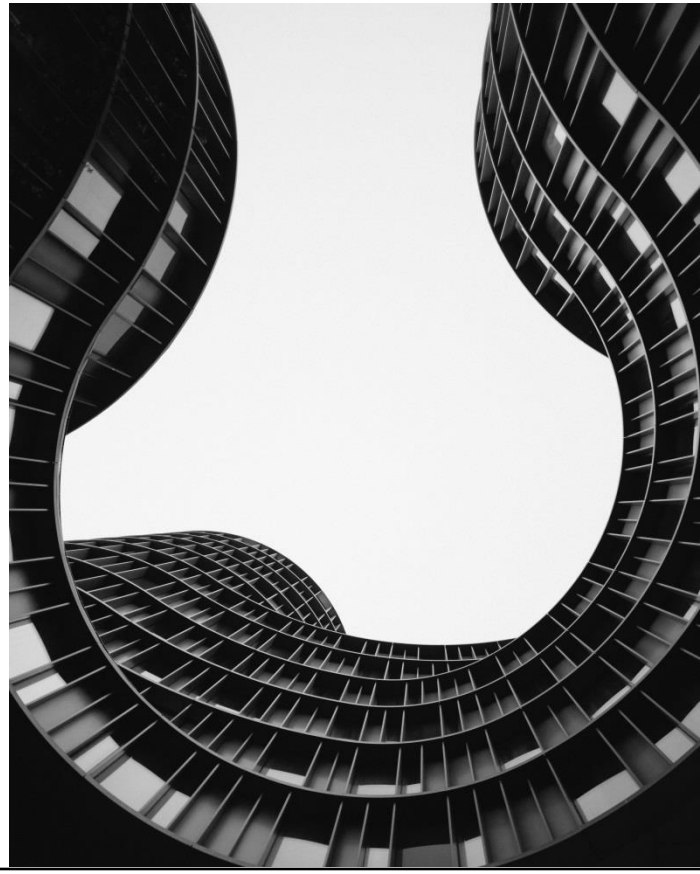
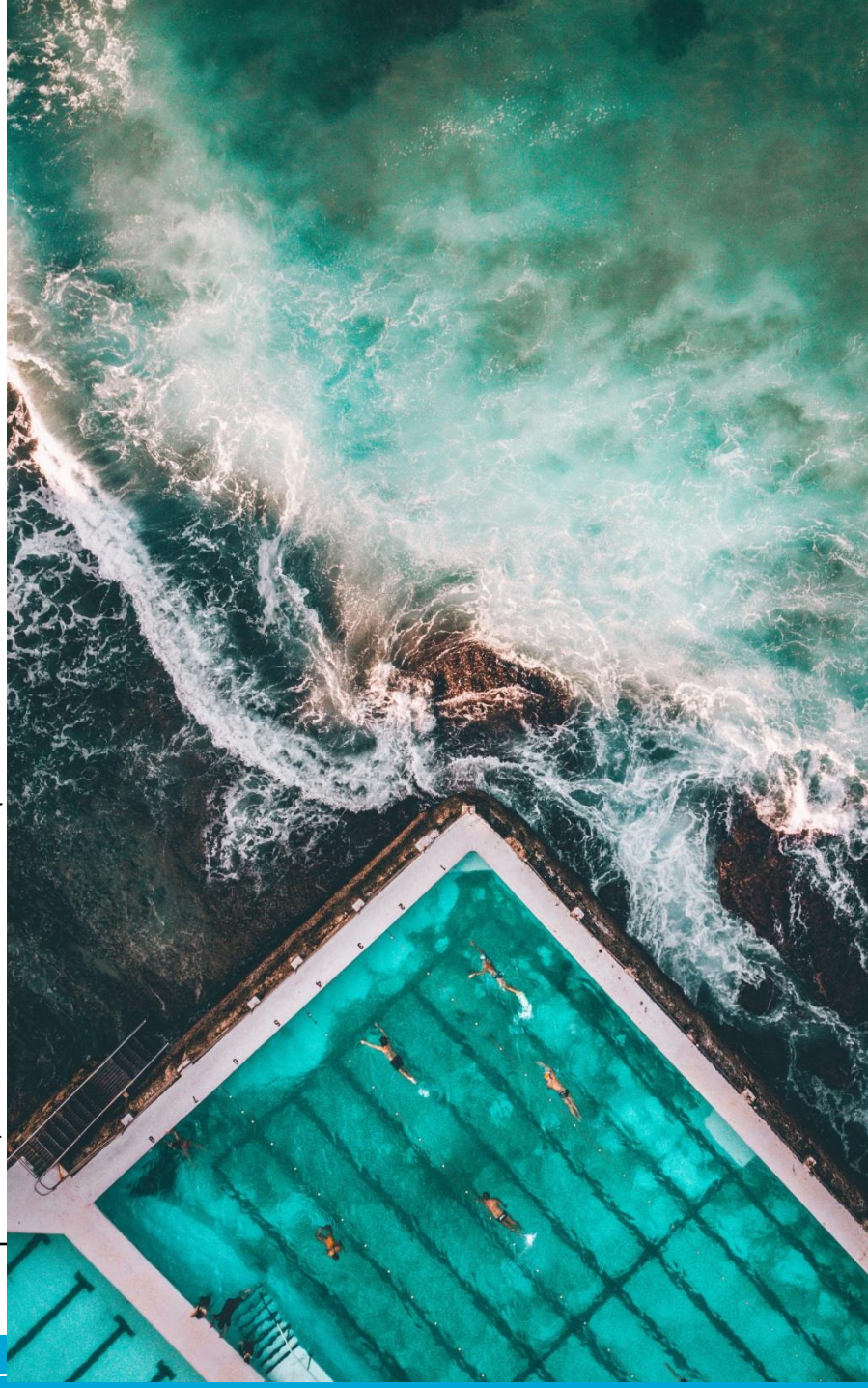


Warming up
(3 minutes)

Talk to your neighbour:

- What is an innovation?
- Give a definition and an example – preferably from your own engineering background



1.2 The Concept of Innovation I

Innovation: novel idea developed and transformed into a product, process or service or has been commercialized

How does innovation upend the system?

- radical innovation
- incremental innovation

1.2 The Concept of Innovation II

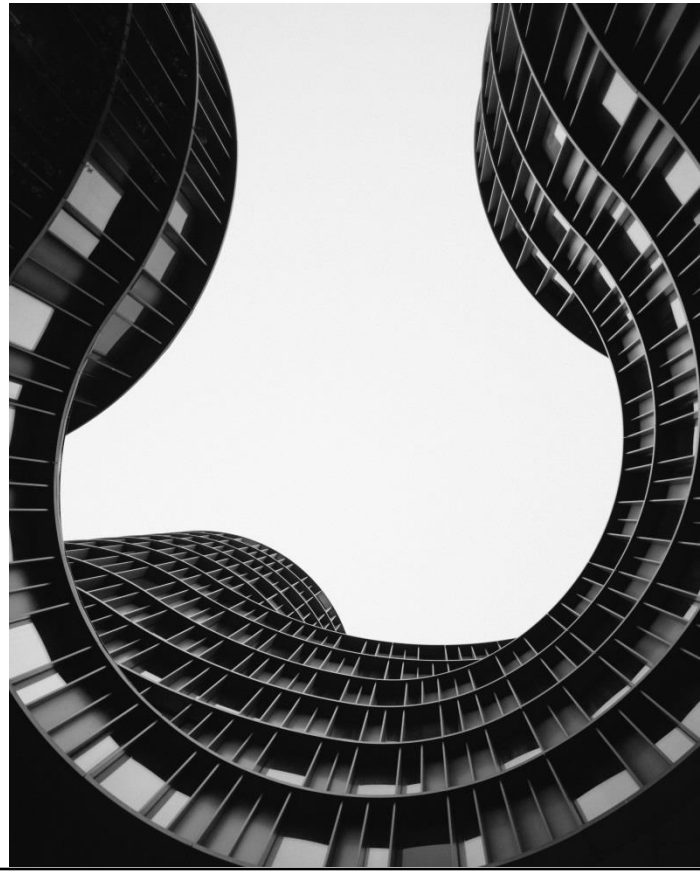
Which part of the economic processes does it influence?

- process innovation
- product innovation
- organizational innovation
- market innovation

1. Innovation: Concept and Measurement

1.1 The Concept of Innovation

1.2 Innovation Indicators: measuring innovation



1.2 Innovation indicators I

classified according to stage in innovation process

- Measures for innovation input
  - R&D investment
  - R&D personnel
- Measures for innovation throughput
  - patent citations
- Measures for innovation output
  - patent applications
  - number of process and product innovations
  - literature-based innovation output indicators, e.g. publications
  - Sales of innovative products

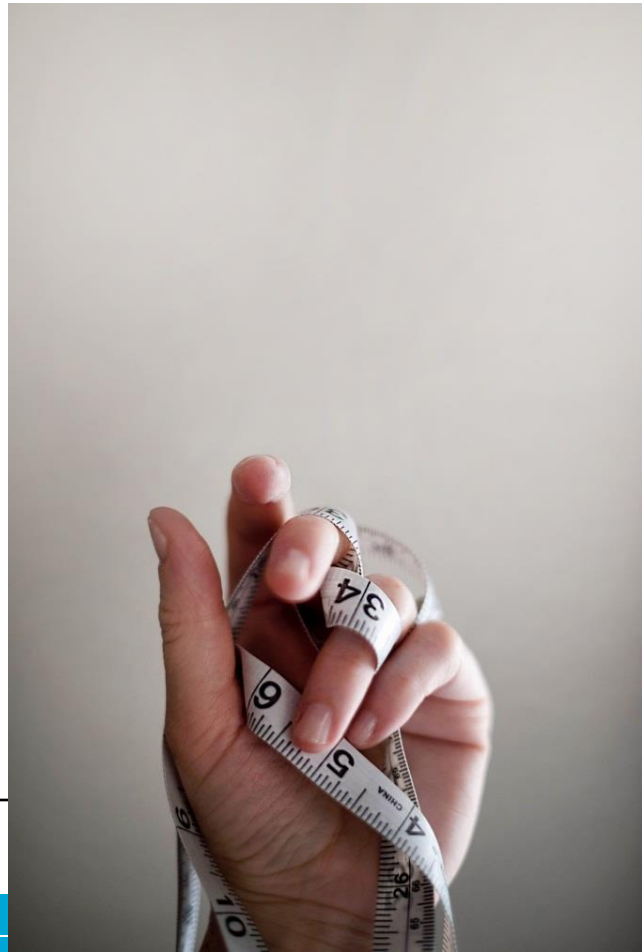
1.2 Innovation indicators: measuring innovation II

Innovation indicators:

- can be both used and abused
- lose information once used as targets for firms, universities or policy
- have different meanings countries in different stages of development

Useful:

- additional quantitative and qualitative indicators
- combined use of indicators



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All information is on Brightspace

Introduction to blended learning

How to pass the course?

How to pass the exam?

All information on MOT113a Technology Dynamics is on https://brightspace.tudelft.nl/

Important files on Brightspace

1. **schedule**
2. **reader**
3. **groups‘ work including exercises**
4. slides
5. additional material

Introduction to (blended) learning

Reader with 7 chapters:

- text
- reading lists
- links to videos

Extra-file with exercises

Important to

- increasingly prepare the lectures in advance
- use lecturing time for discussions

SPOILER: Rules for groups distribution

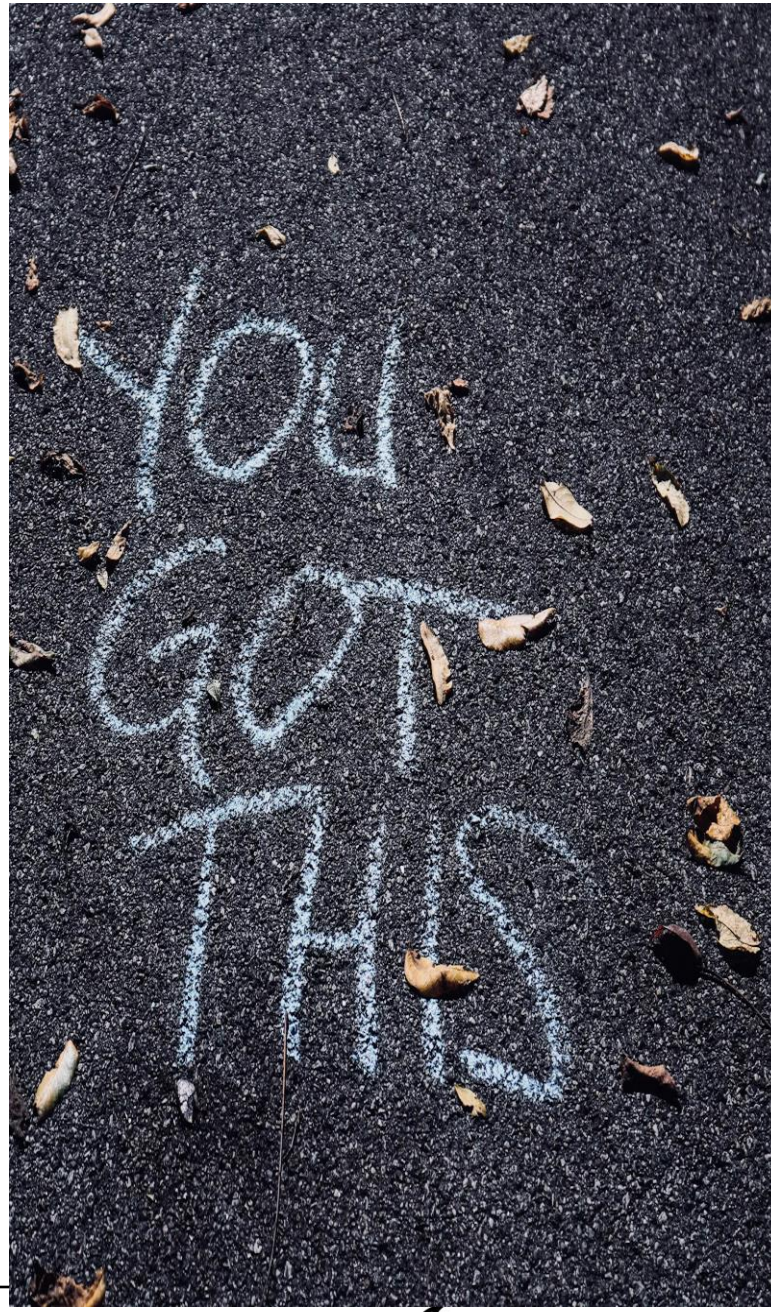
- five students (exceptionally six)
- at least people of two nationalities present
- a maximum of three people having the same nationality

How to pass the course? I

<u>To pass the course</u>,

you must

- **fully attend all workshops**
- **pass the exam**



How to pass the course? II

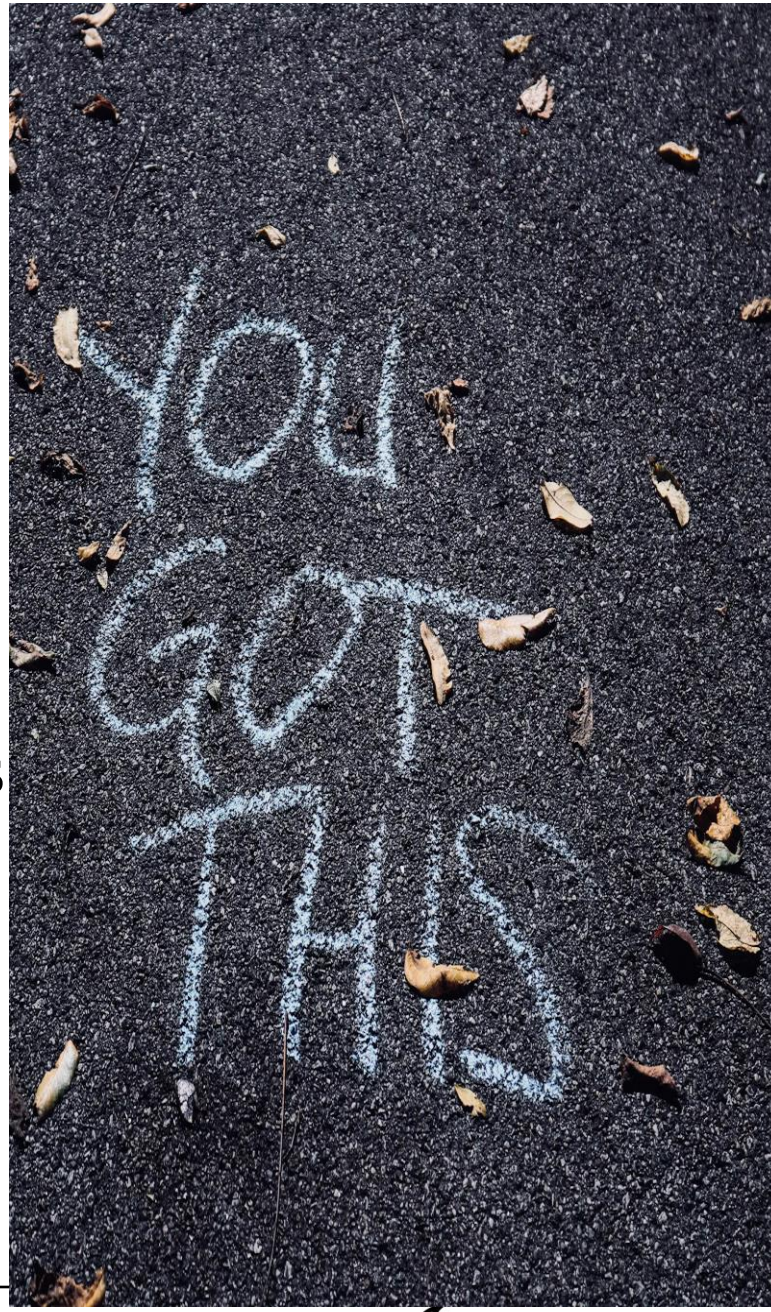
You fully attend all workshops by

a. answering the multi-choice questions during the lectures,

b. joining a group, answering the questions of the exercises during the group's work and uploading the answers within the deadlines,

c. answering and uploading answers to two trial exams within the deadlines,

d. correcting the trial exams of a fellow student and upload their assessment within the deadlines

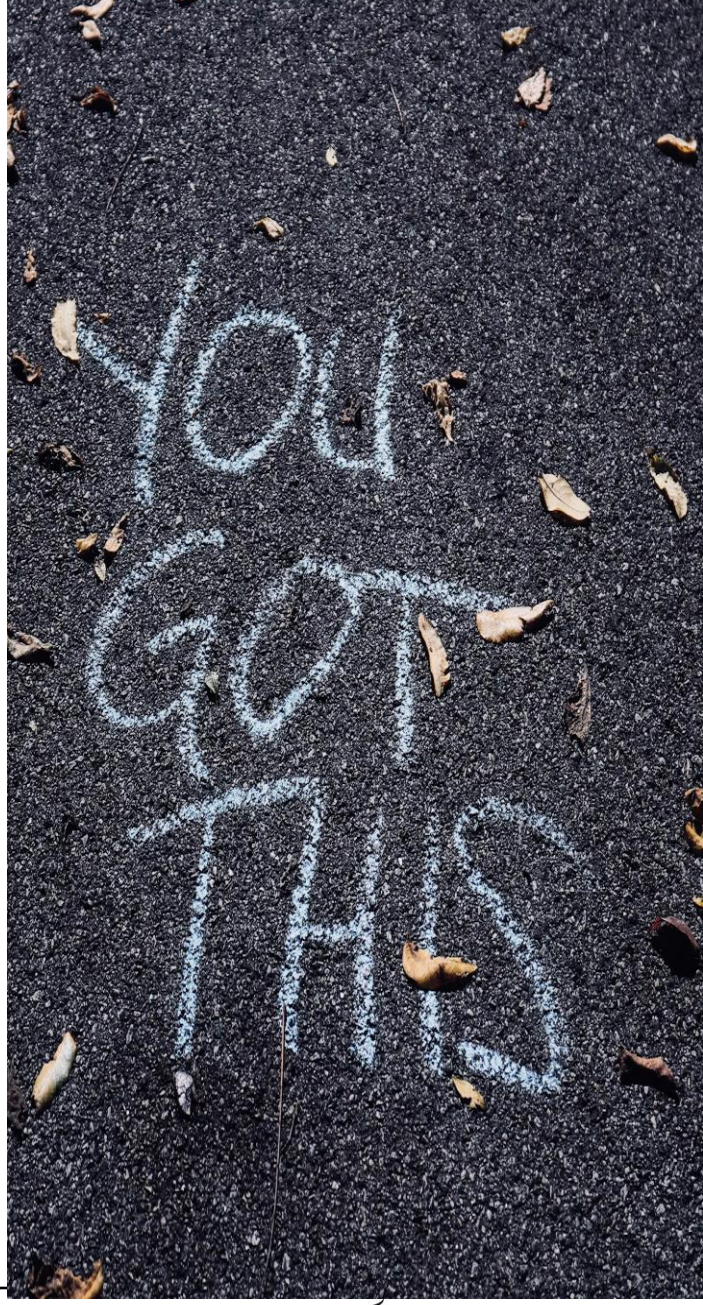


How to pass the course? III

EXTRA ASSIGNMENTS for not fully attending WORKSHOPS

Students can make use of an extra-assignment of missing a workshop once!

They are responsible for submitting the answer to their extra-assignment within the deadline.

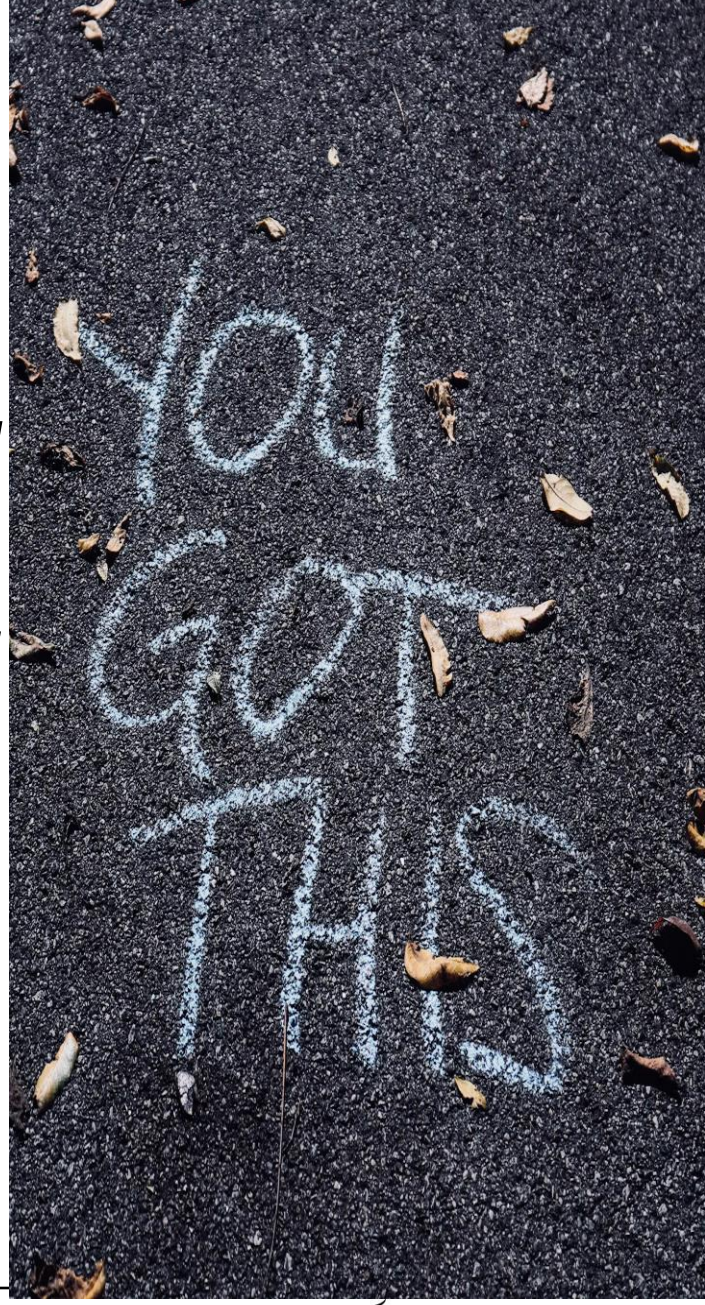


How to pass the course? IV

EXTRA ASSIGNMENTS for not fully attending WORKSHOPS
For another exception, e.g.

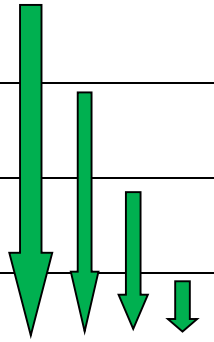
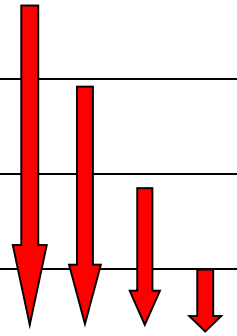
- ***an extra-assignment for a second time,***
- ***missing the deadline of the extra-assignment,***
- ***failing the extra-assignment, or***
- ***requiring any other kind of exception***

students have to consult with one of the study advisors who will advise on how to proceed.



How to pass the course? IV

EXTRA ASSIGNMENTS for not fully attending ALL WORKSHOPS

	being present at	missing **any** part of workshop	extra assignment provided on	deadline of extra-assignment	pass	fail
Workshop I: INTRO	↓	→	29.04.2024 8.00h	30.04.2024 23.59h		
Workshop II: Innovation Syst	↓	→	20.05.2024 8.00h	22.05.2024 23.59h		
Workshop III: RRI Systems	↓	→	03.06.2024 8.00h	05.06.2024 23.59h		
Workshop IV: Outro	↓	→	10.06.2024 8.00h	11.06.2024 23.59h		
Fully attend all workshops	yes				yes	no

How to pass the course? V

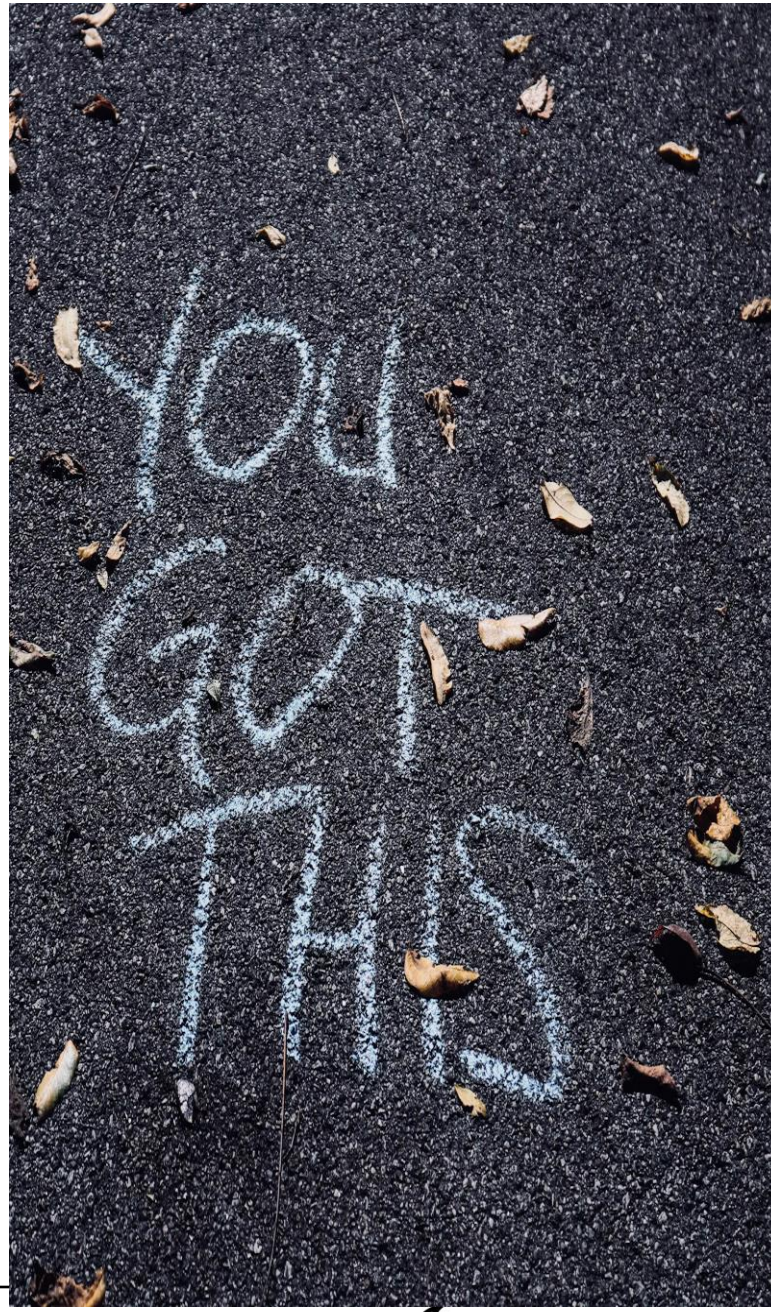
You pass the exam by

getting 104 of 180 points in the exam or the resit

REPETITION

To pass the course, you must

- **fully attend all workshops**
- **pass the exam**



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Introduction to the groups‘ work

- Groups‘ work on campus:
  upload in assignments under your group (compulsory: each student in the group is responsible for the upload)

- Take-away groups‘ work (self-organized): upload answers in the locker
- Tasks for individual follow-up (independent)

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Rules for forming groups:

- five students (exceptionally six)
- at least people of two nationalities present
- a maximum of three people having the same nationality

- Female students can request to be grouped with another female student

Forming groups II

Procedure:

- if you have a group formed according to the rules go to Aspasia, Giorgio or Vaibhav,
- to get your group number and room number,
- together with the other group members go to the assigned room,
- carry out your tasks, and
- be back in lecturing hall at 15.25h the latest.

Forming groups III

Allocation of groups to lecturing halls/instruction rooms

Room	Groups
TPM-Hall B	1-6
TPM-Hall C	7-12
TPM-Hall D	13-17
TPM-Hall E	18-22
TPM-Instruction Room D1	23-26
TPM-Instruction Room D2	27-30

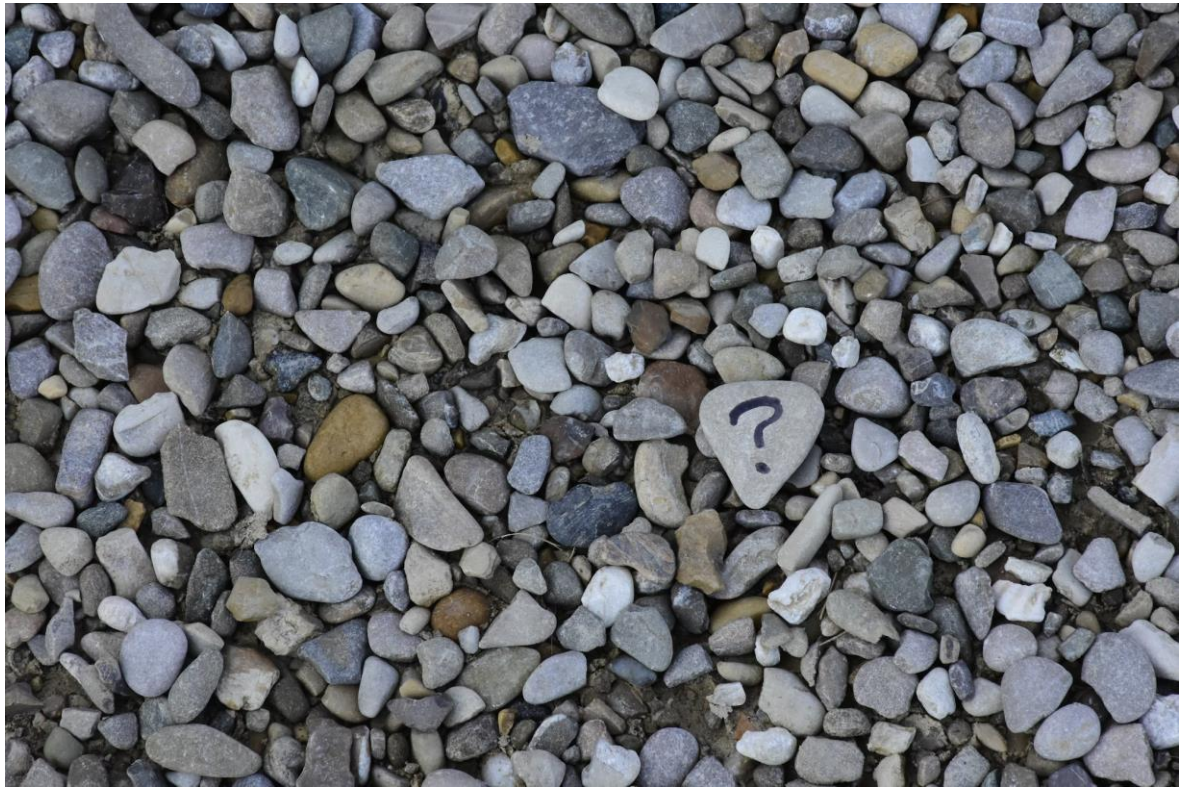
Groups' Work: Chapter 1, Exercise 1 a

Please

- quick-read European Commission (2023): EU Innovation Scoreboard 2023 individually;
- take some notes according to the quick-reading slide, in particular
  - What information do you get from reading the abstract and skimming the headings?
  - Read the introduction and the conclusion. What are the main concepts used?
  - What is the research problem and what is it resolution?
  - Which pages or what parts do you have to read carefully in order to understand the gist of the paper or the webpage?

Groups' Work: Chapter 1, Exercise 1 b

- Compare your notes from Exercise 1a and discuss your findings in the group;
- create a joint slide referring to all points discussed;



We answer your questions during the workshops.