Climate change
Urbanization
Land use change
River engineering works

Rainfall
Floodplain urbanization
Vulnerability
Exposure
Preparedness

Social inequalities
Reduce hazard
Increase exposure
Feedback mechanisms
RAINS            FLOODING             BUILD LEVEE

Climate change
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Social sciences
Natural sciences
Economics
Political sciences
Public health
Engineering

Social sciences
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Social inequalities
Reduce hazard
Increase exposure
Feedback mechanisms
CURRICULUM LEVEL

Extra discipline skills, knowledge, attitude

Rooted foundation in own discipline
Extra discipline skills, knowledge, attitude

Holistic approach to societal needs
Awareness of wicked problems
Skills to collaborate with other disciplines
Exercise flexibility and adaptability

Rooted foundation in own discipline

Resources, time to make room for the horizontal bar
Student ask for THE solution, tend to avoid uncertainty, reluctancy to accept broader perspective
What to prioritize?
COURSE LEVEL

Put contents into broader context
Cross-multi-inter-disciplinary activities
Take students out of their comfort zone
Foster creativity in learning (teaching)

Fundamental theoretical knowledge (fluid mechanics, design of hydraulic structures, water system modelling)
fluid mechanics and circus

Alisan Funk, UNIARTS
assistant professor of circus
Head of Circus Arts at SKH

Benjamin Richter, UNIARTS
guest professor of circus/juggler

Luigia Brandimarte, KTH
associate professor of hydraulic engineering
3rd year KTH students, AE1601/AE1603 Fluid mechanics

1st year SKH students, Performance and Interpretation
SEPTEMBER 2021

KTH STUDENTS
40/90 students registered

GROUP A
20 KTH STUDENTS

GROUP B
20 KTH STUDENTS

CIRCUS
14 UNIARTS STUDENTS
Learn by teaching *(Docendo discimus, Seneca, 2100 year ago)*
you have understood something when you can explain it to someone!
Especially someone with a very different background than yours

>>>creativity in learning

Learn by assessing *(Rebecca Welch, FIFA referee)*
what you learn in class, should not stay in class!
To exercise what you learn, it is a good practice to transport concepts learned in class to the reality of your daily life

>>>take students out of comfort zone
GROUP A
20 KTH STUDENTS

Learning objectives
Transfer of knowledge
Adapt form of communication

GROUP B
20 KTH STUDENTS

Learning objectives
Interpret course contents out of environment

CIRCUS
14 UNIARTS STUDENTS

Learning objectives CIRCUS
Elaborate external input into creative process
GROUP A
20 KTH STUDENTS
CIRCUS 14 UNIARTS STUDENTS
perform
CIRCUS 14 UNIARTS STUDENTS
teach
GROUP B
20 KTH STUDENTS
assess
Discomfort of the unknown
unpredictability of the creative process

Fluid mechanics is not only formulas

Having fun, no classroom norms
as a reaching-out teaching tool
(requires different skills)
Practitioners need to face problems that have no longer recognizable disciplinary boundaries.

Wicked problems

Sustainable learning to equip students with flexible and adaptive mindset to face a fast changing job market.

provide methods and attitude to learning

train students to be creative in learning

Deep learning happens at the border of disciplines

Fundamental knowledge should be complemented by out of disciplinary knowledge; challenge out-of-comfort learning.
Discussion group

Crossing borders


Luigia Brandimarte, KTH
associate professor of river engineering

Alisan Funk, UNIARTS
assistant professor of circus
Head of Circus Arts at SKH
(some) STUDENTS´COMMENTS ABOUT CIRCUS ACTIVITY

…I realised how hard it is to explain something! Also realised how I didn’t understand some things properly (Group A student)

…you had to really apply your knowledge to try and interpret the performances and it showed you new ways of thinking of the different concepts (Group B student)

…highly interesting and creative to learn in this way (Group B student)

…You had to think of what the concepts actually meant instead of just thinking of them as formulas (Group A student)