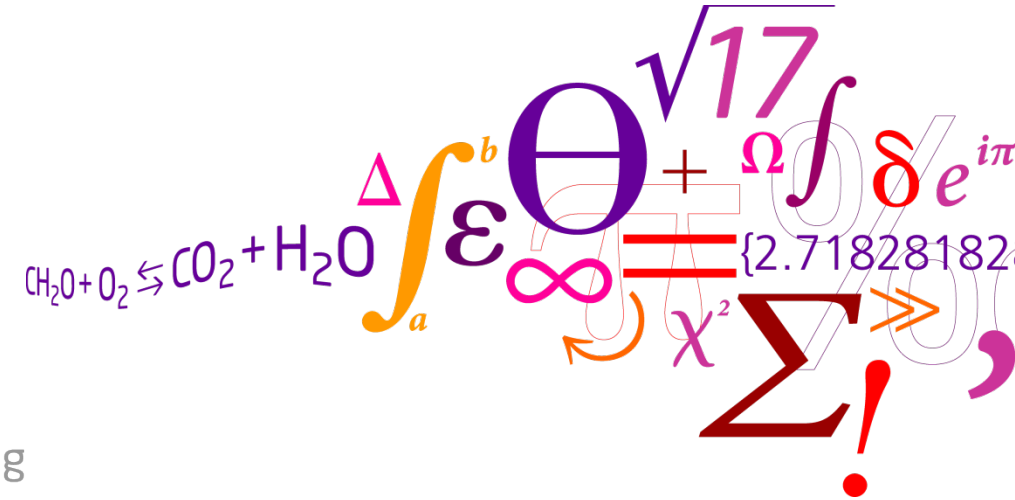
Technical University of Denmark

12140 - Integrated Urban Water Quality Management

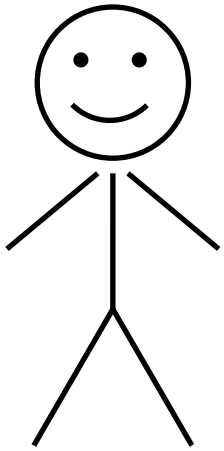
More than 10 yrs e-learning experience

Luca Vezzaro, Assistant professor
Peter Steen Mikkelsen, Professor

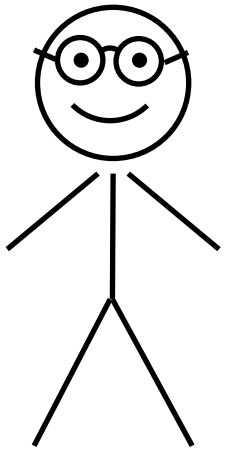


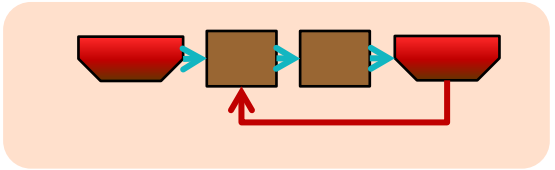
DTU Environment
Department of Environmental Engineering

Why a 100% distant learning course?



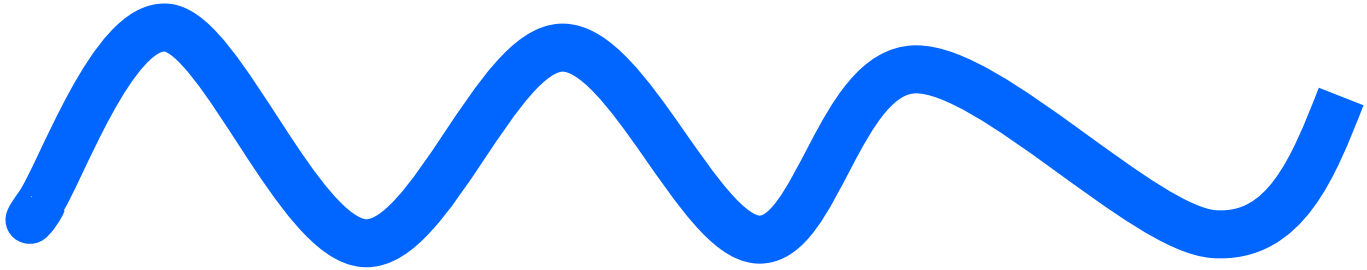
Sewer expert

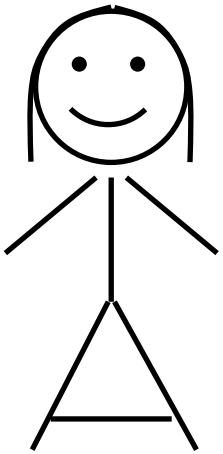




Wastewater expert

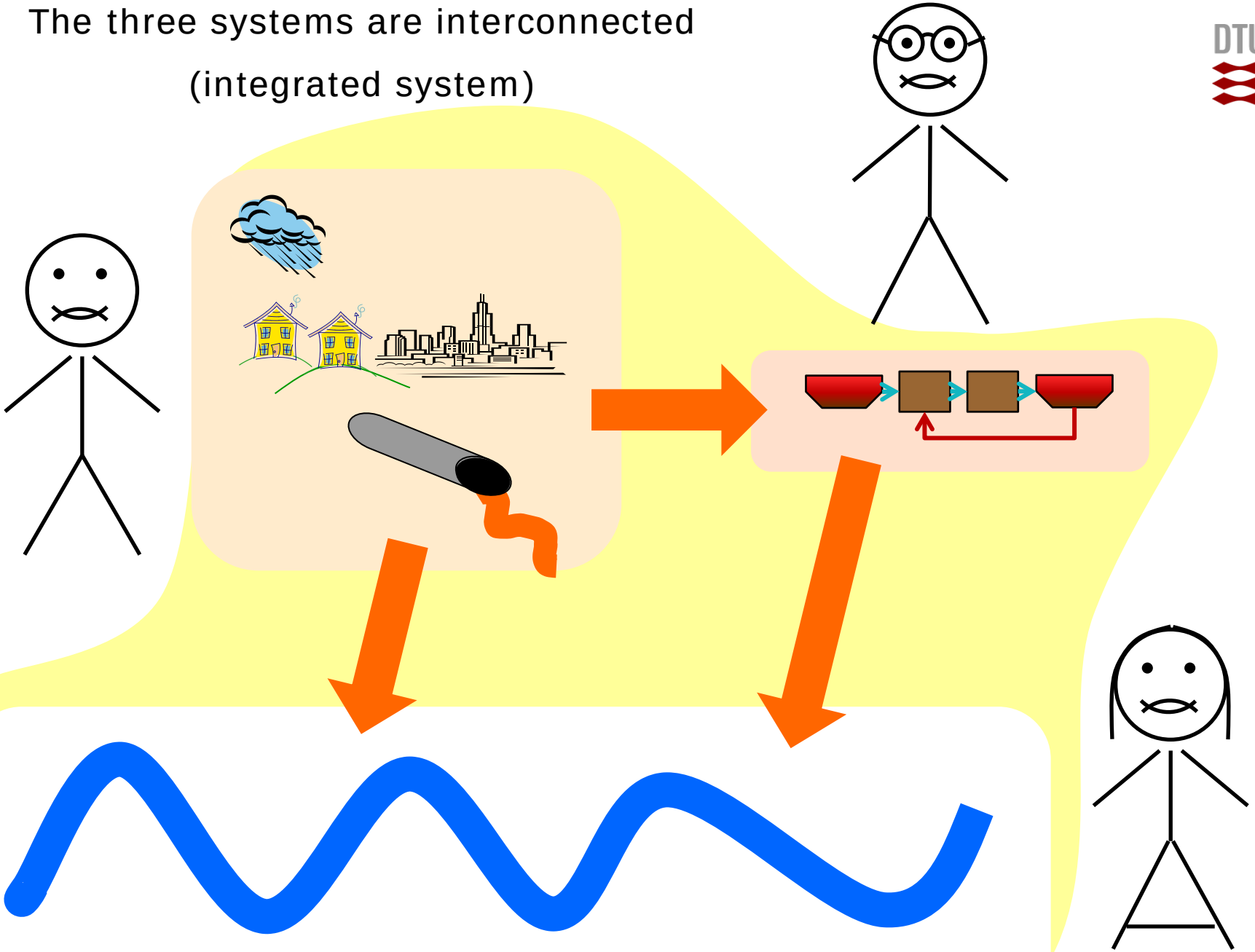
Natural water expert



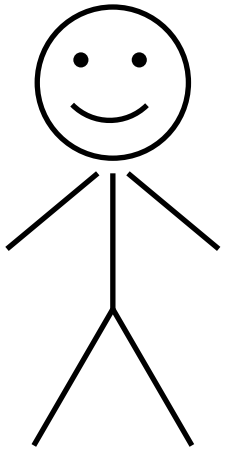


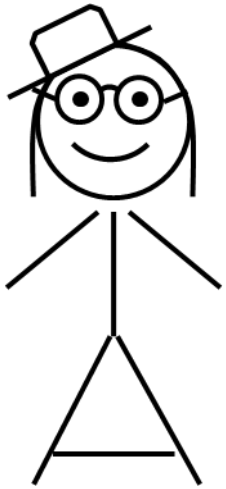
The three systems are interconnected

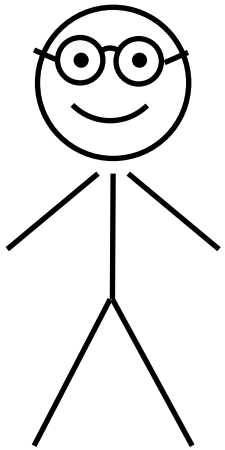
(integrated system)

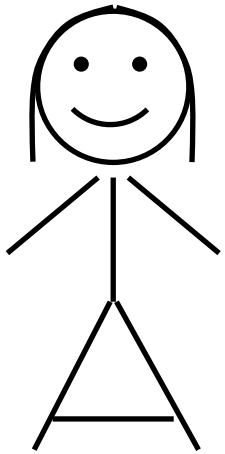


A student at the end of 12140









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Why a 100% distant learning course?

- Students need to describe interactions between elements of the system

  Some background is assumed (course pre-requisites)

- An integrated model is used for simulation of the system (student interpret the model results)

  You can run the model whenever you want

- Flexibility: students can actually foollow other courses scheduled in the same timetable

The long story of 12140 (1)

Research

Teaching

~1970:

- Sewers ~ Civil engineers
- Wastewater treatment plants ~ Chemical engineers
- Receiving waters ~ Natural scientists

~1980:

- Research on interactions between sewers, wastewater treatment plants and receiving waters

~1990:

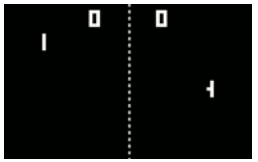
- 1st INTERURBA conference
- 1st version of this course (TRITON) – without e-mail and www

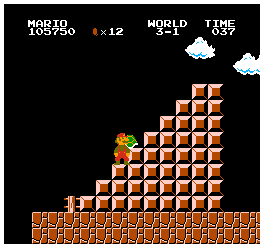
2000:

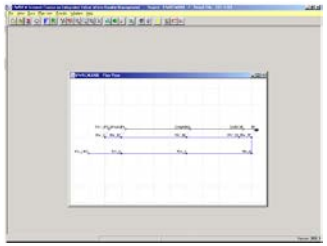
- Completely revised version of the course, new custom made simulation model (UWREM2000) + new www custom made eLearning software (EAW), development supported by EC SOCRATES

2005:

- Moodle introduced as eLearning software at DTU Environment







The long story of 12140 (2)

ScorePP

2007:

Windows Vista – problems with UWREM2000 (move to remote server)

2007-2013:

Development of new integrated models in WEST (e.g. micropollutants) in collaboration with international partners

2014:

DTU adopts Coursera as e-learning platform

WEST-model used in 12140 (beta, only for few volunteers)

2015:

WEST model becomes the official software in 12140

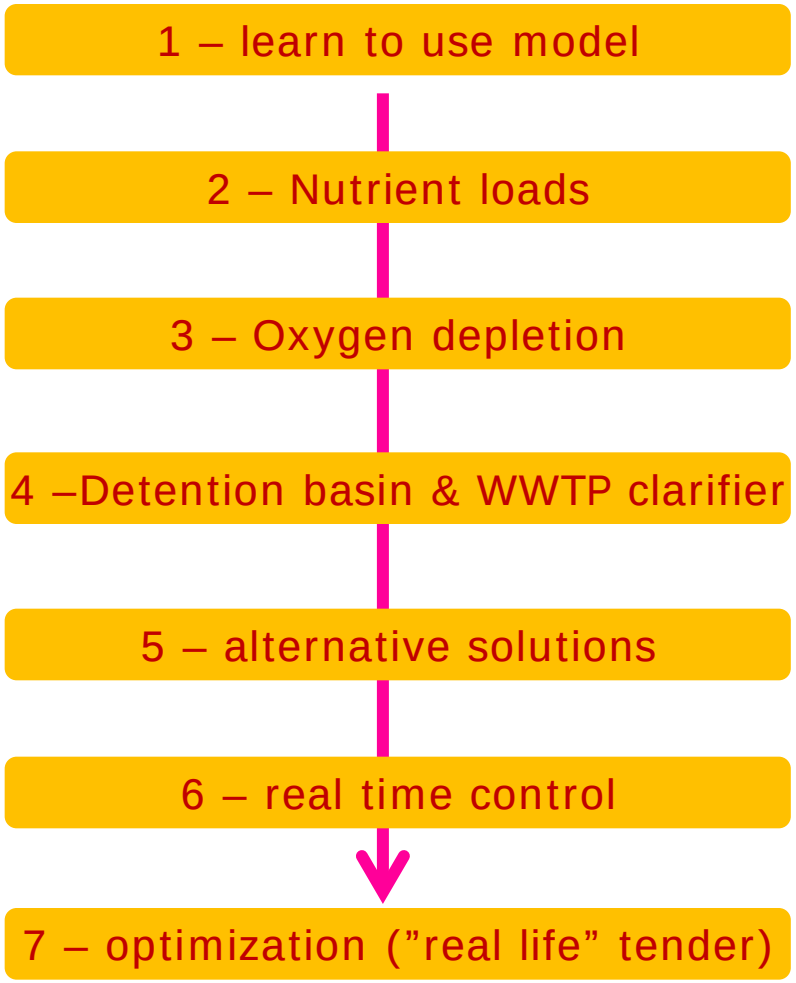
2016:

Canvas is tested as LMS

To summarize – The status for the Autumn 2016 is:

- Reading material — well tested over 15 years *(but always under development)*
- E-Learning platform — 1st time we use it (Canvas)
- Model — 3rd edition

Course Structure



What the students get?

Model simulations

Reading material

Video lectures

Help from their peers

(discussion fora)

How they get evaluated?

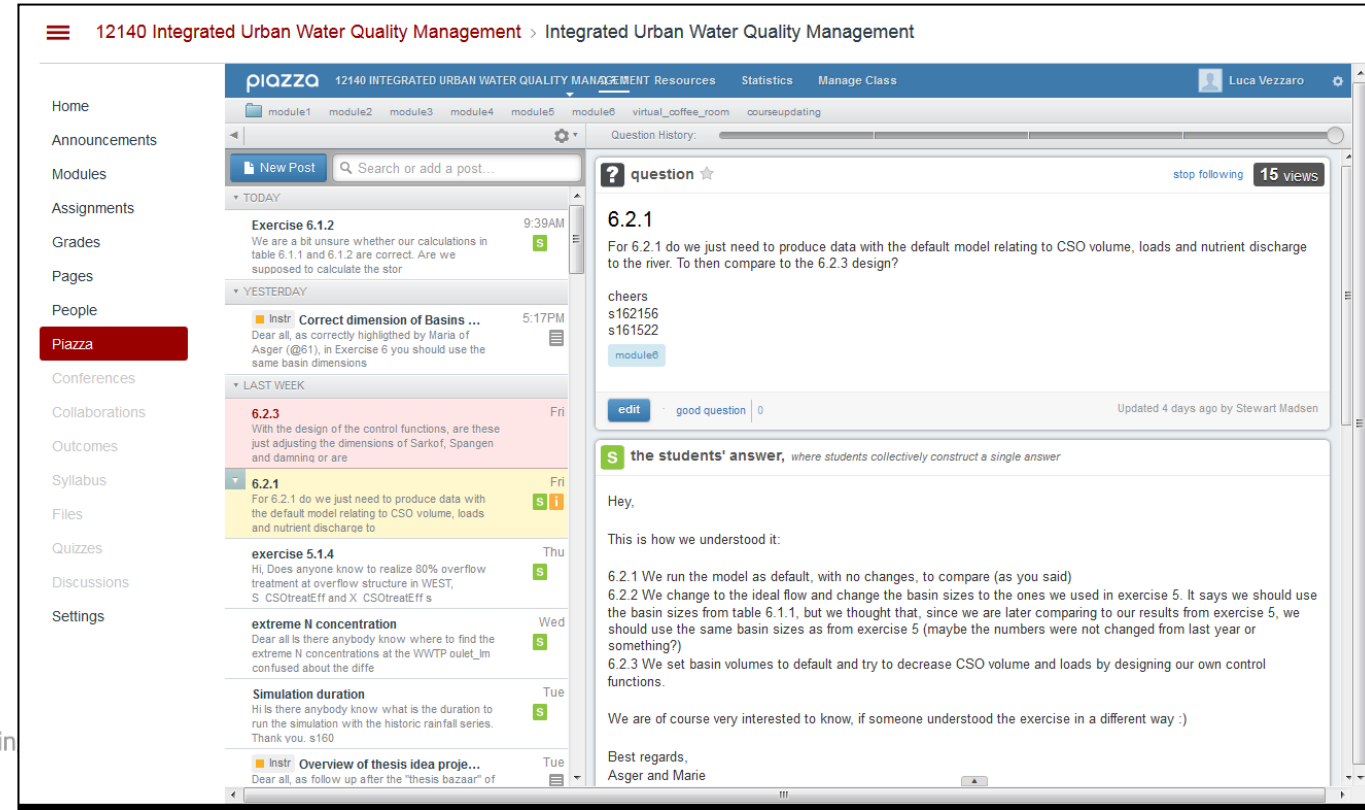
Reports

Quiz

Contribution to the discussion fora

Why the discussion fora?

- Distant learning course – that's the only wat to ask the teachers/ fellow students for help
- Students are encouraged to discuss among themselves (and get to a conclusion)
- Teachers only supervise the discussion (and jump in only in case it is necessary)



Experiences from 12140

- Contrasting feedback from students
  - Some students love it (due to flexibility)
  - Some students hate it (missing the physical interaction)

- Issues with weak students/students without the needed background
  - Something that would take 2 min on a blackboard takes long time to be explained in a chat
  - More video-lectures can substitute ”real-world” lectures

- Other issues:
  - Scalability problem: discussion fora do not work for more than 20-25 students
  - Expectations: students need an introduction to the structure of the course (they do not read/misunderstand the course description)
- Overall – more than 10 year – and still working fine!