Aalto University
School of Engineering

Schedule and practicalities

WAT-E2110 Design and Management of Water and Wastewater Networks

Period IV, Spring 2024

Expected learning outcomes

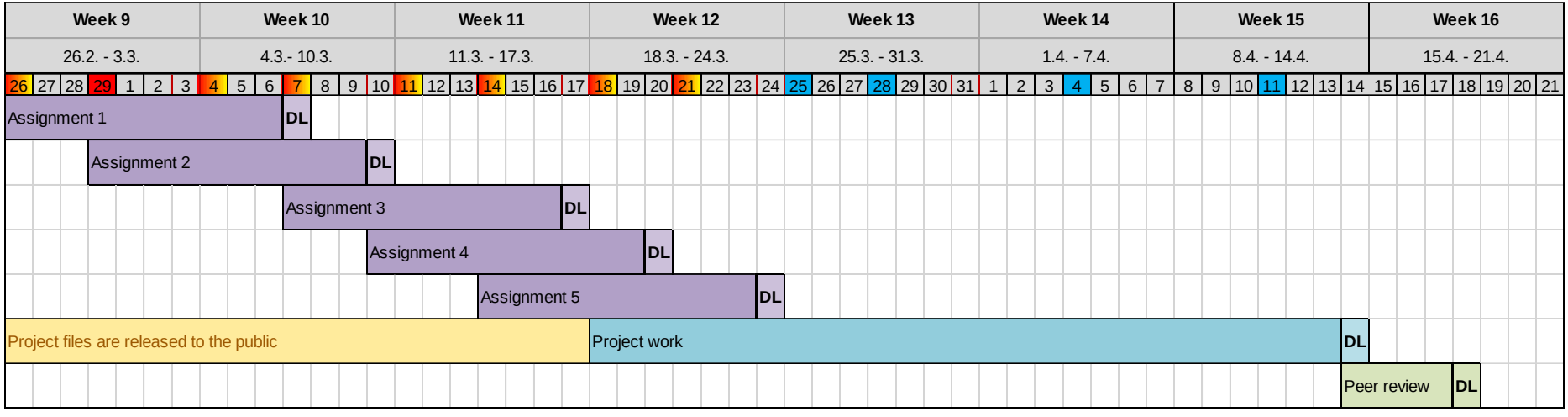
- Recognize the profound influence of water supply services and water quality on public health [*identity*]
- Understand risks related to drinking water quality, modeling of quality [*knowledge*, *skill*]
- Build hydraulic simulation models of water distribution and wastewater collection systems [*skill*]
- Estimate, forecast and manage water demand [*skill*]
- Design water distribution and wastewater collection systems [*skill*]
- Understand the optimization problems related to system design and operation [*knowledge*, *skill*]

Schedule (1/2)

Lecture

Support session

Workshop for the project



Lectures, workshop & feedback: Monday 8:30-12:00 & Thursday 13:00-16:30
Support sessions: Monday 16:30-18:00 & Thursday 16:30-18:00
(assistant Tuomas Haapala).

Schedule (2/2)

- 7 lectures and 7 modeling sessions
- 5 assignments related to lectures
- Project instead of final exam
  - *Introduction to the project work on 21st March session*
  - *Recommended to do the project in pairs*
  - *One out of two topics per pair*
  - *Four workshops during the project work period for getting help using the software & the project*

- Modeling software (Fluidit Water ja Fluidit Sewer) is provided by Fluidit Oy
  - *Instructions can be found from MyCourses: **Sections => Materials => Downloading Fluidit software***
  - *License key is* **10WFJ1-92D0NO-BNYGXS-BIRB70-5048QP**, *https://support.fluidit.fi/ wate2110@aalto.fi, password: Modeling2024*

Lecture topics/Assignments

Lecture topics	Assignment topics*
Lecture 1: Hydraulic modelling of water and wastewater networks	Assignment 1: Sewer and water supply modeling
Lecture 2: Basics of Hydraulics, Management of pressure transients	Assignment 2: Hydraulics and management of pressure transients
Lecture 3: Water quality control in the networks (NB! 10:00-12:00)	Extra reading material regarding the water quality
Lecture 4: Inflow and infiltration and sewer overflows Water demand management, Leakage	Assignment 3: RDII
Lecture 5: System optimization, Pump design	Assignment 4: Reducing energy use and leakage in water supply system
Lecture 6: Water demand management, Leakage	Assignment 5: Modeling leakage
Lecture 7: Hydraulic modeling of sewer and storm water networks	

Assignments are not compulsory but they provide relevant knowledge and skills for project work

Working together is encouraged! If identical documents are submitted, collaboration and partner name must be noted

Project work

- Two topics to choose from:
  - *Sewer and stormwater modeling*
  - *Water supply and water quality modeling*
- One topic per pair
  - *Choose your pair and pick a topic from Group choice in MyCourses*
- Peer review of another pair’s topic after submission
- Submit both project report and model file

Peer review

- Done after submitting the project report
- Review of ***a different*** topic
  - *You review sewer/stormwater project report if you submitted water supply/quality project report*
- Guidelines provided in MyCourses
- 10 points to the final grade if the submission is sensible (i.e. guidelines were followed)
- Topics are distributed before the project DL

Workload & grading

	Points	Maximum points
Assignments (x 5)	12 p / assignment	60 p
Project work	70 p / report 70 p / model	140 p
Total		**200 p**

Grade	Percent	Points
5	89 %	178
4	79 %	158
3	69 %	138
2	59 %	118
1	49 %	98

Workload is estimated to be approx. **135 hours**

- Lectures ≈ 44 h
- Assignments ≈ 35 h
- Project work ≈ 50 h
- Peer review ≈ 3 h

Grading of the course:

- Assignments 30 %
- Project 70 %

Overview of contents

- Basics of hydraulics, management of pressure transients
- Hydraulic modelling of water and wastewater networks
  - *Supervisory control and data acquisition (SCADA), system optimization*
- Water demand management
  - *Leakage and pressure control, innovative pricing, water policies, customer metering, etc.*
- Inflow and infiltration assessment and sewer overflows
- System optimization, pump design
- Water quality control and modeling in the networks
  - *Additional reading material on Health and aesthetic aspects of water quality*
  - *Biofilm, deposits, internal corrosion, odour control*
  - *Risk management (Water Safety Plan)*

Teaching methods

- Contact sessions twice a week:
  - ***Mon*** *8:30-12:00 (U-351, Kandidaattikeskus) &* ***Thu*** *13:00-16:30 (Maari E 229, Maarintalo)*
- Support session with course assistant twice a week
  - *Check schedule and/or course announcements for changes*
- Some supporting reading materials
- MyCourses forums available for questions and support
- Communication via MyCourses announcements and Email

Online practicalities

- All teaching events organized on campus. Some support sessions and as plan B on Teams
  - *Lectures on the General channel, support sessions on Support session channel -> **join the meetings that the teachers have started, do not start your own meetings!***
  - *Channel for asking questions about the assignments*
- Lectures are not recorded
- Lecture slides, assignments and practical information about the course in MyCourses

Aalto University
School of Engineering

Contacts:

Responsible teacher: markus.sunela@aalto.fi
Course assistant: tuomas.2.haapala@aalto.fi

Project work: mika.kuronen@fluidit.fi