



Aalto University  
School of Engineering

# Schedule and practicalities

*WAT-E2110 Design and Management of Water and Wastewater Networks*

*Period IV, Spring 2019*

# Expected learning outcomes

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

# Schedule (1/2)

## LEGEND

- Lecture (Mon in U351; Thu in Maari-E)
- Support session (Vesitalo)
- Workshop for project
- Feedback session

Week 9							Week 10							Week 11							Week 12							Week 13							Week 14																													
25.2.2019-3.3.2019							4.3.2019-10.3.2019							11.3.2019-17.3.2019							18.3.2019-24.3.2019							25.3.2019-31.3.2019							1.4.2019-7.4.2019																													
25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7																							
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Project files are released to the public																		Project work																											DL																			
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Support sessions are organised on Mondays at 13:00.

# Schedule (2/2)

- 6 lectures, 6 modeling sessions
- 6 assignments related to lectures
- Project instead of final exam
  - *It is recommended to do it in pairs*
  - *One out of two topics per pair*
- Modelling software is provided by **Fluidit Oy**
  - *Downloadable from MyCourses*
  - *Can be used at home (but requires 64-bit Java 8) or any Windows computer on campus*

# 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 demand management, Leakage	Assignment 3: Modeling leakage
Lecture 4: Inflow and infiltration and sewer overflows	Assignment 4: RDII
Lecture 5: System optimization, Pump design	Assignment 5: Reducing energy use and leakage in water supply system
Lecture 6: Health and aesthetic aspects of water quality, Water quality control in the networks	Assignment 6: Water quality modeling

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

# 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 is the submission is sensible (i.e. guidelines were followed)
- Topics are distributed before the project DL

# Workload & grading

	Points	Maximum points
Assignments (x 6)	10 p / assignment	60 p
Project work	70 p / report 70 p / model	140 p
<b>Total</b>		<b>200 p</b>

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

- Lectures  $\approx$  44 h
- Assignments  $\approx$  41 h
- Project work  $\approx$  47 h
- Peer review  $\approx$  3 h

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

**Grading of the course:**

- Assignments 30 %
- Project 70 %





# Overview of contents

- Hydraulic modelling of water and wastewater networks
  - *Supervisory control and data acquisition (SCADA), system optimization*
- Basics of hydraulics, management of pressure transients
- 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
- Health and aesthetic aspects of water quality, water quality control in the networks
  - *Biofilm, deposits, internal corrosion, odour control*
  - *Risk management (Water Safety Plan)*

# Teaching methods

- Contact sessions twice a week:
  - *Mon 8:30-12:00 & Thu 13:00-16:30*
- Support session with course assistant once a week
  - *Check schedule and/or course announcements for changes*
- Communication via MyCourses announcements and Email



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# Contacts:

Juho.Kaljunen@aalto.fi

Maria.Dubovik@aalto.fi

Markus.Sunela@fluidit.fi

Mika.Kuronen@fluidit.fi