

VVAN05 Urban Water, 2019

15 ECTS credits (15 “högskolepoäng”) corresponding to 10 weeks of full-time studies.

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The urban water system is an essential part of the infrastructure. In addition to providing safe drinking water to the citizens, the water and wastewater system is also a vital part of the environmental protection. A sustainable water handling is thus needed. We borrow the water from nature and have to treat it in such a way that we can give it back without a negative impact on the environment.

Aim

The aim of the course is to provide knowledge about water and wastewater engineering to be able to design and operate facilities for drinking-water, wastewater and storm-water management in urban areas. See also the course plan at https://kurser.lth.se/kursplaner/19_20%20eng/VVAN05.html

Contents

The course contains to a comparatively large extent tutor-aided lectures and exercises. Small parts of the course are adjusted to the different previous knowledge of the students. The course includes some projects carried out in small groups. Written and oral reports of the projects are presented at seminars. All students will have at least one oral presentation during the course.

The course also includes computer exercises offering the students the possibility to test the knowledge gained during the course. Commercial computer models are used within the course. Written and oral reports of the computer exercises are presented at a seminar. The computer exercise ends with a lecture on how to apply computer modelling to urban water systems. By means of study visits and laboratory lessons possibilities of practical implementation of gained theoretical knowledge from lectures and exercises is offered to the students.

The course includes written examinations.

The course deals with the following areas of knowledge:

- Survey of water resources, water consumption and water quality
- Treatment processes for potable water
- Urban hydrology
- Storm-water handling and treatment
- Computer models on storm-water
- Municipal and industrial wastewater systems
- Physical, chemical and biological treatment processes
- Computer models on wastewater treatment
- Sludge treatment
- Small-scale wastewater management

Required prior knowledge

VVAF01 Water and Wastewater Technology and VVRA05/VVR145 Water or VVRA01/VVR111 Hydrology and Aquatic Ecology and VVRF10/VVR120 Fluid Mechanics *or corresponding*.

Assessment

Written examinations, project assignments, computer exercises and laboration. Oral and written presentations and seminars. The final grade is based on the final written exam (Examination 2).

Parts

Code: 0117. Name: Urban Water (Examination 1).

Credits: 3. Grading scale: UG. Assessment: Written examination 1 Contents: Basic concepts in urban water management as well as the fundamentals of wastewater treatment are examined.

Code: 0217. Name: Mandatory Activities.

Credits: 5. Grading scale: UG. Assessment: Participation at the oral and written presentations. Contents: Project assignments, computer modelling exercises and lab exercises.

Code: 0317. Name: Urban Water (Examination 2).

Credits: 7. Grading scale: TH. Assessment: Written examination 2 Contents: The final exam that examines storm water management, drinking water treatment, wastewater treatment and sludge treatment in an urban perspective.

List of mandatory activities

Exercise 1 + seminar

One (short) oral presentation per person

Project assignment + seminar

Computer exercise 1 + seminar

Computer exercise 2 + seminar

Laboratory lesson on drinking-water treatment

Strongly recommended activities

Study visits

Required reading (see separate reading instructions):

- Mackenzie L. Davis: Water and Wastewater Engineering, Design Principles and Practice. McGraw-Hill Education, 2010, ISBN: 978-0-07-171384-9 (or 978-0-07-128924-5 or 978-0-07-339786-3)
- Lecture notes and other material. *Will be available on the course web page during the course period.*

Some suggested optional reading:

- Environmental Engineering by Ruth F. Weiner and Robin A. Matthews. Fourth edition. Elsevier, 2003. *Available as E-book if you are logged into the Lund University network or by your STIL username at:*
<http://www.sciencedirect.com/ludwig.lub.lu.se/science/book/9780750672948>
- About water treatment – Kemira Kemwater (available for reading at KC library)
- Wastewater treatment in Sweden - <http://www.swedishepa.se/Documents/publikationer/978-91-620-8416-5.pdf>

Where to be

In addition to lecture rooms at Chemical Centre (KC), please note that some of the lectures and exercises during the course will take place in other LTH-buildings. Many different classrooms will be used throughout the course, please see the schedule. The study visit sites (optional) are available by public transport by bus or train. Students pay for the travel costs themselves.

For maps of Chemical Centre, see www.kc.lu.se.

Staff

Course coordinator

ÅD	Åsa Davidsson	Senior Lecturer	asa.davidsson@chemeng.lth.se
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EE	Ellen Edefell	Teaching assistant	ellen.edefell@chemeng.lth.se

Some of the guest lecturers

VL	Viveka Lidström	Viveka Lidström (own company)
HF	Helena Flinkberg	VA SYD
IC	Ingemar Clementson	DHI Group
EM	Eva Mattsson	Kemira
BH	Bengt Hansen	Kemira
HT	Henrik Thorén	Thoréns IT
TW	Thomas Welander	AnoxKaldnes / Veolia
BMW	Britt-Marie Wilén	Water Environment Technology, Chalmers University of Technology

Cheating/Plagiarism/References

All students must be familiar with “Policy on Plagiarism and Deceitful Plagiarism in First, Second and Third Cycle Higher Education at Lund University’s Faculty of Engineering” which can be found at:

https://www.lth.se/fileadmin/lth/anstallda/projektdata/bas/ak_hederlighet/PolicyPlagiarismLTH20100408.pdf

References in texts and reports can e.g. be done according to the so-called Harvard System of Referencing. All students must know how to do correct referencing. A Harvard System of Referencing Guide can be found at e.g.

<http://libweb.anglia.ac.uk/referencing/harvard.htm>

In accordance with our policy on plagiarism, ALL reports will be checked via the text matching tool URKUND. More information about the URKUND system can be found at <http://www.orkund.com/student>