



LUNDS UNIVERSITET  
Lunds Tekniska Högskola

*Course syllabus*

## **Avrinnings-modellering Rainfall Runoff Modelling**

**VVRN10, 7,5 credits, A (Second Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED W

**Date of Decision:** 2023-03-27

### **General Information**

**Main field:** Water Resources Engineering.

**Elective for:** MWLU2, V5-vr, W5-vr

**Language of instruction:** The course will be given in English

### **Aim**

The course is part of the International Master's programme in Water Resources (WaterLU). It is also an optional course for students of Civil Engineering and Environmental Engineering ("civilingenjör V, W") specialising in Water Resources and for students of Technical Mathematics ("civilingenjör Pi") specialising in Environment, Risk and Climate. The course deals with the hydrological processes in detail. The students also gain skills in rainfall/runoff modelling as well as increased knowledge and skills with respect to modelling and project work in a more general sense.

### **Learning outcomes**

*Knowledge and understanding*

For a passing grade the student must

- be able to describe - showing deep insights - the components of the hydrological cycle and their relationship with the runoff process,
- be able to describe and discuss principles and techniques used in conceptual rainfall/runoff models and understand their limitations.

*Competences and skills*

For a passing grade the student must

- be able to adapt and implement a rainfall/runoff model to a watershed, and understand

the methodology

- be able to present project results scientifically in the form of a report written in English
- be able to orally present hydrological results in English for other engineers

### *Judgement and approach*

For a passing grade the student must

- be able to critically evaluate rainfall/runoff models and results based on models,
- show deep understanding of the necessity of presenting uncertainty in results and the limitations of methods when using results based on hydrological models.

## **Contents**

Run-off modelling in rural areas. Hands-on exercises using computer models. Associated topics; rain characteristics, snow melt, melt water movement, water movement in the unsaturated zone, surface run-off, linear reservoir theory, conceptual modelling. Thermo- and hydrodynamics of lakes. Assignments include an essay, rainfall-runoff modelling and lake routing.

## **Examination details**

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** Assessment is based on three assignments and a written examination.

Marking of assignments is based on both form and content of a written report. For passing grade an oral presentation is also required. The written exam is "closed book" and consists of questions which are mainly open in character. The course grade is a weighted average of the four marked components.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

## **Admission**

**Assumed prior knowledge:** Hydrology : VVR111/VVRA01 or VVR145/VVRA05 or corresponding.

**The number of participants is limited to:** No

**The course overlaps following course/s:** VVR140

## **Reading list**

- Ward & Robinson: Principles of Hydrology (4th ed.). McGrawHill 1990. ISBN 0 07 709502 2. (recommended).
- Bengtsson, Lars Excerpt from Lars "Hydrology – Theory and processes", Dept of Water Resources Engineering Lund University. Translated from Swedish by Rolf Larsson Sept 2004 (available on course web site).
- The students are expected to find supplementary literature and references for the assignments.

## **Contact and other information**

**Course coordinator:** Magnus Persson, magnus.persson@tvrl.lth.se

**Course coordinator:** Johanna Sörensen, johanna.sorensen@tvrl.lth.se

**Course homepage:** <http://www.tvrl.lth.se/utbildning/courses/>