

## Course PM – Applied Hydrology AE2610, VT 2025

Credits: 7.5 hp

Course responsible and examiner: Anders Wörman

Contributing teacher: Joakim Riml

Invited lectures: Tyréns AB and the Swedish Meteorological and Hydrological Institute (SMHI)

### Examination criteria

Mandatory exercises, 3.0 hp

Written examination, 4.5 hp

No. students: 29 registered, whereof 28 followed the course and 27 took the written exam.

### Course content and learning objectives

Applied Hydrology (AE2610) is a course about runoff processes at the catchment scale or, in other words, a course about catchment hydrology. During this course you will learn more about how water runoff processes can cause floods of rivers and urban environments and about their importance for assessing the water availability for irrigation, municipal water-use and hydropower. The course links important mechanisms in terrestrial hydrology to provide a systematic overview of runoff processes, including evaporation and heat fluxes in water, groundwater and surface water flows. You will particularly apply theoretical methods, but also learn to use computational softwares dedicated to deal with runoff in rural and urban landscapes as well as more generic modeling tools such as Matlab and Comsol Multiphysics.

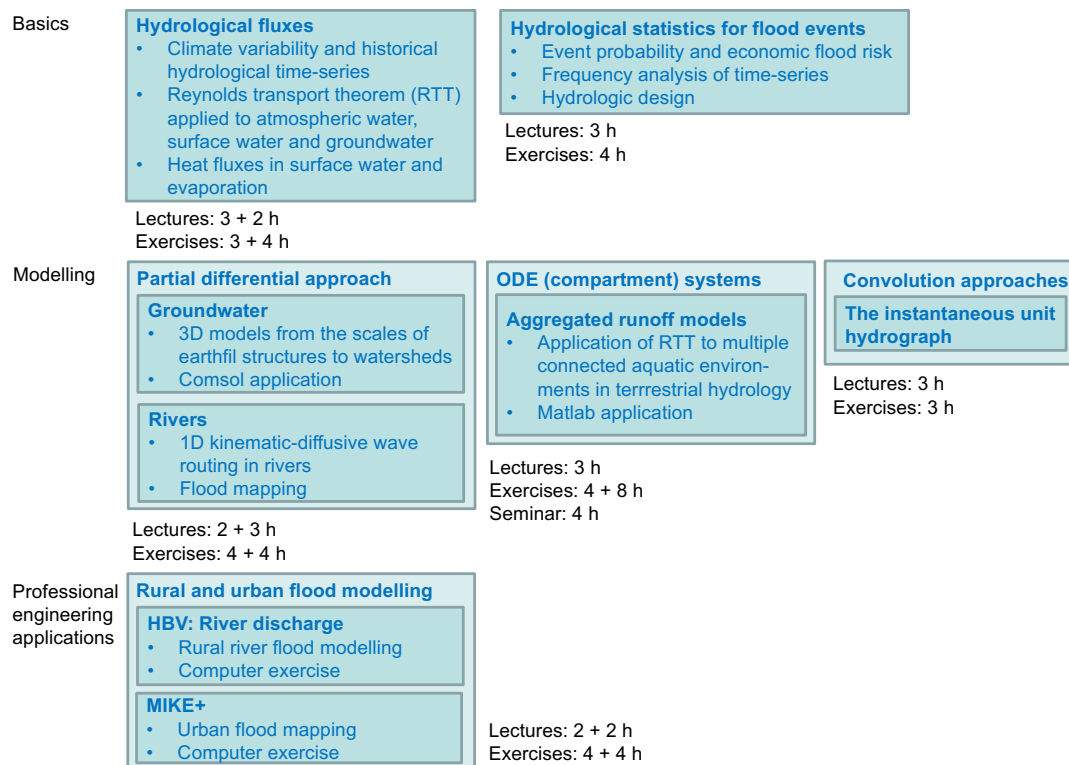


Fig. 1: Course content and teaching activities distributed on various aspects.

## Teaching activities – types and extent

This course has been provided mostly on campus, but some lectures were provided on Zoom. The course is divided in 11 modules or sessions dealing with the concepts described in the figure above. About 1/3<sup>rd</sup> of the teaching activities are classroom lecturing and 2/3<sup>rd</sup> are based on groupwise exercises supervised by teachers.

This course consists of lectures and teacher supervised exercises, some of which are computer-based and some are theoretical assignments with manual calculations. All exercises can be conducted at the KTH campus, even if the supervision by external teachers is conducted online for a few of them. Reservations of computer rooms with the appropriate program installations are done according to the schedule presented in the study directions.

This is a summary of teaching activities:

- “Conventional” lecturing: 23 hours
- Guided / supervised exercises in groups: 44 hours, whereof about half is computer based and half is theoretical. Computer exercises are conducted using softwares like Matlab  
Comsol Multiphysics  
Mike+  
Tyréns AB gave an exercise on urban flood modelling using Mike+ and SMHI gave an exercise on rural runoff modelling using selective softwares.
- Report feed-back from mandatory assignments and one seminar evaluation.
- Written examination