Module name	**Hydrological modelling practice**
Module number	CMS-TRK-EM2
Senior Lecturer	Prof. Dr. Niels Schütze niels.schuetze@tu-dresden.de
Qualification objectives	Students master methods for creating and validating complex, spatially highly dissolved river basin models and can carry out calculations of the territorial water balance and assess the results critically, objectively and application-relatedly.
Contents	The module shall include the methods and tools of good hydrological modelling practice, including aspects of sensitivity and uncertainty analysis.
Forms of teaching and learning	The module includes lectures of 1 SWS, exercises of 3 SWS and self-study. The teaching language of lectures and exercises may be German or English and will be specifically determined by the teacher at the beginning of each semester and announced in the usual manner.
Eligibility for participation	The competences to be acquired in the module CMS-TRK- EM1 Hydrological Modeling are assumed.
Usability	In the Masters Course Computational Modeling and Simulation, the module is an optional module in the Track Computational Environmental Science and Engineering, to be selected in accordance with Annex 2 to the Specific Examination Regulations. The module cannot be chosen in the Master's Course Computational Modeling and Simulation if this or a module with substantially the same content from a Course with which the entry conditions under § 3 of the Studienordnung have been met has already been completed. The module provides the pre-requisites for the modules it designates under the pre-requisites for participation.
Conditions for the award of credits	Credits are awarded when the module test is passed. The module test consists of a complex performance of 60 hours. The language of the exam will be German or English, at the student's choice.
Credits and marks	The module allows 5 credit points to be obtained. The module score corresponds to the test performance score.
Frequency of the module	The module is offered every summer semester.
Workload	The total workload is 150 hours.
Duration of the module	The module covers 1 semester.
Module name	**Numerical methods in hydrosciences**

Module number	CMS-TRK-EM3
Senior Lecturer	Prof. Dr. Bernhard Vowinckel bernhard.vowinckel@tu-dresden.de
Qualification objectives	Students are familiar with different methods of finding a numerical solution for non-analytical equation systems, as well as selected examples of hydrosciences where this problem arises. They are able to apply numerical methods to selected problems in the hydrosciences themselves in order to integrate the underlying partial differential equations with handwritten software in space and time, analyse this software for its solution behaviour and present the results.
Contents	The content of the module is problem formulation for hydro-systems, numerical methods for integrating partial differential equations, discretisation schemes in space and time, formulation of initial and boundary conditions, interpolation methods, creation of linear equation systems and solution algorithms for linear equation systems using self-written software.
Forms of teaching and learning	The module includes lectures of 2 SWS, exercises of 2 SWS and self-study. The teaching language of lectures and exercises may be German or English and will be specifically determined by the teacher at the beginning of each semester and announced in the usual manner.
Eligibility for participation	Bachelor-level knowledge of advanced mathematics and physics is required.
Usability	In the Masters Course Computational Modeling and Simulation, the module is an optional module in the Track Computational Environmental Science and Engineering, to be selected in accordance with Annex 2 to the Specific Examination Regulations. The module cannot be chosen in the Master's Course Computational Modeling and Simulation if this or a module with substantially the same content from a Course with which the entry conditions under § 3 of the Studienordnung have been met has already been completed. The module provides the pre-requisites for the modules it designates under the pre-requisites for participation.
Conditions for the award of credits	Credits are awarded when the module test is passed. The module test consists of 50 hours of domestic work. The language of the exam will be German or English, at the student's choice.
Credits and marks	The module allows 5 credit points to be obtained. The module score corresponds to the test performance score.
Frequency of the module	The module is offered every winter semester.

Workload	The total workload is 150 hours.
Duration of the module	The module covers 1 semester.