Module name	**Computational Fluid Dynamics**
Module number	CMS-TRK-CFD
Senior Lecturer	Prof. Dr. Jochen Fröhlich jochen.froehlich@tu-dresden.de
Qualification objectives	Students master basic discretisation techniques for partial differential equations of flow mechanics. They are able to create, apply, analyse for key properties and validate these algorithms using appropriate tests.
Contents	The content of the module is the classification of differential equations, finite differences algorithms and finite volumes, the analysis of the numerical properties of the procedures in terms of convergence, consistency and stability. Furthermore, resolution procedures for resulting equation systems and selected applications are content of the module.
Forms of teaching and learning	The module includes lectures of 2 SWS, exercises of 2 SWS and self-study. The language of the lectures and exercises will be English.
Eligibility for participation	Knowledge of the basics of mathematics, in particular analysis, basics of numerics and basics of flow mechanics, in particular maintenance equations and similarity indicators, at bachelor's level is required.
Usability	The module is a mandatory module in track computational engineering in the Masters Course Computational Modeling and Simulation. In the Masters Course Computational Modeling and Simulation, the module is an optional module in the Track Computational Mathematics and in the Track Computational Life Science, 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 120-minute away day. The language of the test will be English.
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.
Accompanying literature	Street Computational Methods for Fluid Dynamics, 4th ed. Joel H. Ferziger, Milovan Perić, Robert L. Street. Springer, 2020.