Module name	**Numerical methods for partial differential Equations – Basic concepts**
Module number	CMS-TRK-MA28
Senior Lecturer	Director of the Institute of Numerical Mathematics id.numerik@tu-dresden.de
Qualification objectives	Students are able to analyse specific elliptical problems independently and, by choosing appropriate discretisation techniques in suitable Sobolev areas, to solve numerically and apply error estimation techniques and adaptive discretisation techniques to problems with partial differential equations.
Contents	The content of the module includes discretisation techniques for elliptical problems, apriori and a-posteriori error estimation techniques, properties of Sobolev spaces and fundamental principles of convergence analysis.
Forms of teaching and learning	The module includes lectures of 3 SWS, exercises of 1 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	Competences in the numerics of common differential equations, as well as Hilbertraume and linear operators at bachelor's level are required. The following literature is suitable for preparation: Numerical mathematics 2: Integration of common differential equations. Peter Deuflhard, Folkmar Bornemann. De Gruyter, 1995.
Usability	In the Master's Course Computational Modeling and Simulation, the module is a compulsory module in the Track Computational Mathematics. In the Masters Course Computational Modeling and Simulation, the module is an optional module in the Track Computational Modeling in Energy Economics, to be selected in accordance with Annex 2 to the Specific Test Rules. 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 non-public oral test performance as an individual test lasting 25 minutes. 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.