Only the german version of the module description as part of the study regulations is legally binding.

Module name	**High-performance computing**
Module number	CMS-COR-HPC
Senior Lecturer	Prof. Dr. Wolfgang Nagel wolfgang.nagel@tu-dresden.de
Qualification objectives	Students can describe strategies and methods of parallel processing of parallel computer architectures. They can assess parallel architectures and network concepts and their suitability for different parallel algorithms. They are able to develop simple parallel programmes that exploit different types of parallelism.
Contents	The content of the module shall be based on High Performance Computing and its programming, strategies and methods of parallel processing, including programming models widely used in supercomputing. Other content includes architecture and network concepts and the necessary algorithmic building blocks in close connection with practical experience from the interdisciplinary field of work of CIDS Department ZIH – Information Services and High Performance Computing.
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	Skills in building computer systems at bachelor's level and basic skills in using a Unix commander environment and programming language C are required. The following literature is suitable for preparation: 1. Introduction to high performance computing for scientists and engineers, G. Hager, G. Wellein. CRC Press, 2010. https://www.taylorfrancis.com/books/9780429190612, 2. Computer Architecture, Fifth Edition: A Quantitative Approach, John L. Hennessy, David A. Patterson. Morgan Kaufmann Publishers Inc., 2011. https://dl.acm.org/doi/book/10.5555/1999263, 3. Programming: Principles and Practice Using C++, Bjarne Stroustrup. Addison-Wesley Professional, 2014, https://learning.oreilly.com/library/view/-/9780133796759/?ar, 4. The Linux Command Line, 2nd Ed., W.E. Shotts. No Starch Press, 2019. https://learning.oreilly.com/library/view/-/9781492071235/?ar.

Usability	In the Masters Course Computational Modeling and Simulation, the module is a compulsory optional module of the basic technical training, to be selected in accordance with Annex 1 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 90-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.