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| Module name | **Scientific programming – Advanced concepts** |
| Module number | CMS-TRK-MA33 |
| Senior Lecturer | Director of the Institute of Scientific Computing<br>id.wir@tu-dresden.de |
| Qualification objectives | Students have a systematic understanding of aspects of software development for the efficient realisation of numerical algorithms. You have experience in assessing, applying and expanding such software. |
| Contents | The content of the module includes aspects of software development, such as programming on high performance computers, object-oriented programming and template-based programming. |
| 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 | Programming skills and bachelor-level modelling and simulation skills are required. The following literature is suitable for preparation:<br>Mathematical modelling. Christof Eck, Harald Garcke, Peter Knabner. Springer, 2017. |
| Usability | In the Master's Course Computational Modeling and Simulation, the module is a compulsory module in the Track Computational Mathematics. In the Computational Modeling and Simulation Masters Course, the module is an optional module in Track Computational Engineering in Track Computational Modeling in Energy Economics, to be selected in accordance with Annex 2 to the Specific Test 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. |

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