Module name	**Scientific Software Engineering**
Module number	CMS-COR-SSE
Senior Lecturer	Prof. Dr. Uwe Aßmann uwe.assmann@tu-dresden.de
Qualification objectives	Students master basic methods, construction elements and notations for systematic modelling, design and development of large object-oriented software systems of scientific numeracy, with particular attention to the re-use of classes and frameworks, the use of design patterns and their basis for role modelling. They are able to contribute to the design and development of large-scale software systems according to the consolidated state of the art and apply them in practical scenarios.
Contents	The module will include UML classic design patterns and programming languages for the variability, extensibility and reuse of components and software frameworks.
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	Basic knowledge of computer programming, in particular the principle of object orientation, programming in Java, C#, Python, C++, UML modelling, e.g. class diagrams, object diagrams, condition diagrams, sequence diagrams at bachelor level, is required. The following literature is suitable for preparation: Design Patterns: Elements of Reusable Object-Oriented Software. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides. Addison Wesley, 1994.
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 non-public oral test performance as an individual test lasting 15 minutes. Bonus performance for oral examination performance is the release of 15 hours of computer-assisted exercise tasks. 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.