Module Number	**Module Name**	**Responsible Lecturer**
CMS-CLS-MOS	Modelling and Simulation in Biology	Prof. Dr. Ivo Sbalzarini ivo.sbalzarini@tu-dresden.de
Qualification Objectives	After completing the module, the students master the modelling and simulation of biological systems in space and time. They are able to independently derive models of biological processes, formulate them mathematically and simulate them numerically in the computer. The corresponding simulation codes can be designed and implemented independently.	
Contents	The content of the module includes: model scaling, dimensional analysis, dynamic system storage and flow modelling, spatiotemporal systems volume control model, spatio-temporal finite-difference simulation, spatiotemporal system particle methods, cellular automata and agent-based discrete systems, applications in diffusion, advection-diffusion, collective cell behavior, embryogenesis and tissue regeneration.	
Teaching and Learning Methods	2 SWS lectures and 2 SWS exercises as well as self-study.	
Prerequisites for Participation		
Usability	The module is a compulsory module for students of Computational Life Science in the Master's program Computational Modelling and Simulation.	
Requirements for the Awarding of Credit Points	The credit points are awarded if the module examination is passed. For more than 10 registered students, the module examination consists of a written examination amounting to 120 minutes. For up to 10 registered students, it consists of an oral examination as individual examinations amounting to 30 minutes; this will be announced to the enrolled students at the end of the enrollment period.	
Credit Points and Grades	This module allows for the earning of 5 credit points. The module grade corresponds to the grade of the examination performance.	
Frequency of the Module	The module is offered each year during the summer semester.	
Workload	The workload is a total of 150 hours.	
Duration of the Module	The module takes one semester.	