Module number	Module name	Module coordinator
BIW-MA-AC-E-09	Computational Dynamics	Prof. Dr. Michael Kaliske statik@mailbox.tu-dresden.de
Learning goals	The students have an overview about the central and basic themes, fields of work as well as applications of computational dynamics. They are able to solve dynamical problems of structures by applying enhanced numerical methods. Thus, they are able to analyze and evaluate difficult as well as complex problems of this subject. They are also able to weigh options of action and estimate consequences. The students are enabled to act carefully in this subject.	
Content	Content of this module are computational methods for dynamic structural analysis, such as analysis of single-mass-oscillator within time and frequency domain, analysis of multi degrees of freedom systems, eigen-oscillations, modal analysis, modal superposition, damping-models, deformation-method, linear dynamics, element formulations, transformation relations, sub-structural and condensational techniques, numerical computations within time domain, central-difference-method, analysis of time-integration-methods, continuous systems, applications, earthquake-analysis and loads due to linear momentum.	
Teaching and learning methods	2 SWS lecture, 1 SWS exercise, self studies.	
Prerequisites	The knowledge of the modules of basics of continuum mechanics, tensor calculation as well as energy methods and finite-element-methods are the prerequisites of this module. Especially solution strategies for engineering and scientific problems by numerical-mathematical methods, by the application of fundamental concepts of continuum mechanics and related variational principles are required. Within the first semester, study and methodological competences of the mentoring program are basis for this module, in order to achieve the expected knowledge as well as for its scientific application.	
Applicability	The module is one of the 12 elective modules within the Master's Program Advanced Computational and Civil Engineering Structural Studies – ACCESS. Five of them have to be chosen.	
Requirements for earning credit points	The credit points are gained, if the examination of the module is successful. The examination is an exam with a duration of 120 minutes. The language of the exam is English.	
Credit points and grades	5 credit points are to be gained from this module. The grade of the module is the grade of the exam.	
Module frequency	The module is taught every summer semester.	
Workload	The workload is 150h in total.	

Module duration	The module duration is one semester.
Recommended reading list	Clough, Penzien: Dynamics of Structures, McGraw-Hill. Argyris, Mlejnek: Dynamics of Structures, North-Holland. Meskouris: Structural Dynamics, Ernst & Sohn.