

Module number	Module name	Module coordinator
BIW-MA-AC-E-01	Design of reinforced concrete structures	Prof. Dr. Steffen Marx concrete@tu-dresden.de
Learning goals	Students can assess the load-bearing capacity of existing structures, determine the necessary rehabilitation and strengthening measures, and calculate related design parameters. They understand and are capable of implementing basic calculation methods relevant to the knowledge acquired during the course and interpreting the measured values obtained through tests, calculations, and examinations. The content of the course enables them to analyze and evaluate complex problems in the subject, as well as to weigh up options for action and assess consequences. Through the course, the students are given the means to conduct safe and responsible designs.	
Content	Contents of the module are topics on maintenance principles of bridges and buildings such as inspection, examination, testing and condition assessment of existing reinforced concrete structures, load tests and the monitoring of structures made of reinforced concrete, calculation of the load-bearing capacity and load reserves of existing buildings and bridges utilizing specific calculation methods, reinforcement methods for solid structures and their computational verification for shotcrete, steel lamellae, lamellae made of carbon fiber-reinforced plastic, textile-reinforced concrete and external pre-stressing.	
Teaching and learning methods	2 SWS lectures, 1 SWS exercise, and self-study.	
Prerequisites	The knowledge to be acquired in the Building Materials module is assumed, particularly about the material and load-bearing behavior of reinforced concrete structures, internal forces analysis, and the different design methods of reinforced concrete.	
Applicability	The module is one of twelve elective modules in the master's program Advanced Computational and Civil Engineering Structural Studies - ACCESS, five of which must be chosen.	
Requirements for earning credit points	The credit points are acquired if the module examination is passed. The module examination consists of a written paper of 90 minutes duration. The language of the examination is English.	
Credit points and grades	Five credit points can be acquired through the module. The module grade corresponds to the grade of the examination performance.	
Module frequency	The module is offered every summer semester.	
Workload	The total workload is 150 hours.	
Module duration	The module covers one semester.	

Recommended reading list	Eurocode 2: Design of Concrete Structures Fib bulletin 14: Externally bonded FRP-reinforcement for RC structures; Fib bulletin 17: Management, maintenance, and strengthening of concrete structures.
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