

Module number	Module name	Module coordinator
BIW-MA-AC-E-11	Bridge Design	Prof. Dr. Richard Stroetmann richard.stroetmann@tu-dresden.de
Learning goals	<p>Students shall be able to plan and design concrete, steel and composite bridges on traffic routes and their crossings. They shall be proficient in the strategies of conceptual design and are able to develop different structural and construction variants taking into account specific boundary conditions. They can understand the assessment criteria for bridge designs. They are able to select suitable variants for realisation and justify their selection in a well-founded manner.</p> <p>The students are capable of modeling and calculating bridge structures. They are proficient in the computer-aided engineering (CAE) calculation of internal forces as well as the preliminary design and the construction stages of bridges.</p>	
Content	<p>The contents of this module include the historical development of bridge engineering, design principles in bridge constructions, conceptual bridge design, static and dynamic actions on bridges, construction methods, preliminary design of bridge structures, different types of structures, such as slab, beam, frame, truss and arch bridges. Types of prestressing, such as external/internal or bonded/without bond, substructures such as piers and abutments, equipment elements, such as transition constructions and bearings. Fatigue problems, modeling, calculation of bridges with CAE and preparation of design documents are other contents of the module.</p>	
Teaching and learning methods	2 hours of lectures, 1 hour of exercise per week and self-study	
Prerequisites	<p>Knowledge of the material and load-bearing behaviour of steel and reinforced concrete structures, the internal force analysis of statically indeterminate systems and the different design methods for reinforced concrete, steel and composite structures at the bachelor level is required.</p>	
Applicability	<p>The module is one of twelve optional modules in the Master's program Advanced Computational and Civil Engineering Structural Studies - ACCESS, five of which have to be chosen.</p>	
Requirements for earning credit points	<p>The credit points are acquired if the module examination is passed. The module examination consists of a complex effort of 60 hours. The examination language is English.</p>	
Credit points and grades	<p>Five credit points can be acquired through the module. The module grade is calculated from the grade of the examination result.</p>	
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	<p>Fritz Leonhardt: Bridges - Aesthetics and Design, 4. Auflage, Stuttgart, Deutsche Verlags-Anstalt, 1994.</p> <p>Christian Menn, Eugen Brühwiler: Stahlbetonbrücken, 3. Auflage, Heidelberg, Springer, 2003.</p> <p>Karsten Geißler: Handbuch Brückenbau – Entwurf, Konstruktion, Berechnung, Bewertung und Ertüchtigung, Ernst & Sohn, 2014.</p> <p>Svensson, H.: Cable-Stayed Bridges - 40 years of experience worldwide. Published by Ernst & Sohn, Berlin 2012.</p>