



Number of module	Name of module	Lecturer
BIWE-10	Modelling and Simulation in Pavement Engineering	Prof. Wellner
Content and qualification aim	<p>Content of the module:</p> <ul style="list-style-type: none">• Basics about the input parameter for the pavement design process (traffic loading, climatic conditions, material properties)• Modelling of the pavement conditions:<ul style="list-style-type: none">○ Temperature gradients, calculation models to determine relevant temperature gradients, comparison to measured data in the field○ Modelling of the tire-pavement interaction under consideration of vehicle properties, comparison to field measurements• Modelling of the deformation behavior of materials used in pavements (unbound granular materials, asphalt, concrete)• Modelling of the layer bond conditions of flexible pavements• Design of a numerical simulation model: material performance, element approaches, structural model, multi-physics• Numerical multi-physical structural analysis• Numerical calculations• Validation of the laboratory test results using the results of large-scale field tests <p>After having finished the module successfully students have in-depth knowledge on analytical and numerical methods to model and simulate pavement performance.</p>	
Type of course	2 hours lectures, 1 hour of exercise per week, and self-study	
Requirements for study	Knowledge from module BIWO-01 and study competence from module BIWO -05	
Practical use of the module	The module is one of the elective modules in the Master's programme: Advanced Computational and Civil Engineering Structural Studies, of which seven have to be chosen.	
Requirements for the award of credits	<p>The credits are awarded if the module examination is successfully passed.</p> <p>The module examination consists of a written examination (120 min).</p> <p>Prerequisite for the examination is an assignment of 40 hours.</p>	
Credits and grades	<p>4 credits can be acquired for this module.</p> <p>The grade is the grade of the written examination.</p>	
Frequency of module	The module is offered every academic year (summer semester).	
Workload	The workload is 120 working hours.	
Duration of the module	1 semester	

Recommended literature

- Highways, The Location, Design, Edited by C. A. O'Flaherty, 2002, ISBN 0 7506 5090 7
- Design and Performance of Road Pavements, D. and P. Croney, ISBN 0 07 014451 6