

<b>Module code</b> (1.)	<b>Module description</b> (2.)	<b>Category</b> (3.)
MBI 2550 Stand: 07.10.2021	Urban Infrastructure Diagnostics and Conservation	Int. Master
	<b>Degree program</b> (4.)	Sustainable Engineering of Infrastructure
	<b>Faculty</b> (5.)	Civil Engineering and Conservation / Restoration

<b>Module supervisor</b> (6.)	Prof. Dr.-Ing. Ralf W. Arndt
<b>Type of module</b> (7.)	P (obligatory)
<b>Frequency</b> (8.)	Annually
<b>Standard semester of study</b> (9.)	2nd semester
<b>Credits (ECTS)</b> (10.)	5 ETCS
<b>Assessment</b> (11.)	Written examination (90 minutes)
<b>Language of instruction</b> (12.)	English
<b>Admission requirements</b> (13.)	-
<b>Module is a requirement for</b> (14.)	-
<b>Module duration</b> (15.)	1 semester
<b>Mandatory registration</b> (16.)	Moodle
<b>Applicability of module</b> (17.)	Civil Engineering

<b>Course</b> (18.)	<b>Lecturer</b> (19.)	<b>Type</b> (20.)	<b>No. of students (max.)</b> (21.)	<b>No. of courses per week</b> (22.)	<b>Contact hours per week</b> (23.)	<b>Workload</b>		
						<b>Face-to-face</b> (24.)	<b>Self-study</b> (25.)	
<b>1</b> Urban Infrastructure Diagnostics and Conservation	Prof. Dr. Arndt	Lecture	25	1	3	45	45	
<b>2</b> Urban Infrastructure Diagnostics and Conservation	Prof. Dr. Arndt, Dipl.-Ing. Hetzel	Lab / tutorial	25	1	1	15	45	
<b>Total</b>						<b>4</b>	<b>60</b>	<b>90</b>
<b>Workload for the module</b> (26.)							<b>150</b>	

<b>Learning objectives</b> (27.)	This course is an introduction to the basics and practical application of non-destructive testing (NDT) of multiple materials in structural elements, buildings and monuments. The course aims to provide fundamental and user-oriented insights into NDT by exploring the latest developments, principles, instrumentation, signal processing, problem solving methods and case studies. The students will be enabled to learn and put into practice the most up-to-date theories and methods.
<b>Course contents</b> (28.)	Selected contents: <ul style="list-style-type: none"> <li>• basic physical principles</li> <li>• basics of signal processing</li> </ul>

	<ul style="list-style-type: none"> <li>• rebound hammer and endoscopy</li> <li>• concrete cover measurement / Ferroskan</li> <li>• ground-penetrating radar</li> <li>• ultra-sound</li> <li>• infrared thermal imaging</li> <li>• electrochemical methods for detecting corrosion</li> <li>• dye penetrant and magnetic particle testing</li> <li>• portable hardness testing using the Brinell principle</li> <li>• pile testing</li> <li>• etc.</li> <li>• excursion to specialist company/test centre</li> </ul>
<p><b>Preliminary exam requirements and assessment</b> (29.)</p>	<p>Assessment:</p> <ul style="list-style-type: none"> <li>• preliminary examination requirement: successful participation in the lab experiments and completion of written test reports</li> <li>• final 90-minute examination</li> <li>• assessed using grades 1-5</li> <li>• module grade is included in the overall grade in proportion to the number of credits earned</li> </ul>
<p><b>Literature</b> (30.)</p>	<ul style="list-style-type: none"> <li>• <a href="https://www.ndt.net/search/">https://www.ndt.net/search/</a> (NDTnet)</li> <li>• Arndt, S.: Slide script (Moodle)</li> </ul>