

<b>Course code</b>																																	
<b>Type and description</b>	Elective Course																																
<b>ECTS credit</b>	1																																
<b>Course name</b>	Modern Experimental Methods in Concrete Structures																																
<b>Course name in Polish</b>	Współczesne metody badawcze w konstrukcjach żelbetowych																																
<b>Language of instruction</b>	English																																
<b>Course level</b>	8 PRK																																
<b>Course coordinator</b>	dr inż. Michał Gołdyn																																
<b>Course instructors</b>	dr inż. Michał Gołdyn																																
<b>Delivery methods and course duration</b>	<table border="1"> <thead> <tr> <th></th> <th>Lecture</th> <th>Tutorials</th> <th>Laboratory</th> <th>Project</th> <th>Seminar</th> <th>Other</th> <th>Total of teaching hours during semester</th> </tr> </thead> <tbody> <tr> <td>Contact hours</td> <td>0</td> <td>0</td> <td>0</td> <td>15</td> <td>0</td> <td>0</td> <td>15</td> </tr> <tr> <td>E-learning</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td></td> </tr> <tr> <td>Assessment criteria (weightage)</td> <td></td> <td></td> <td></td> <td>100</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Lecture	Tutorials	Laboratory	Project	Seminar	Other	Total of teaching hours during semester	Contact hours	0	0	0	15	0	0	15	E-learning	No	No	No	No	No	No		Assessment criteria (weightage)				100			
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<b>Course objective</b>	<p>The aim of the course is:</p> <ol style="list-style-type: none"> <li>1. to acquaint the course participants with the scientist's work and prepare for independent development of concepts and programs of the experimental research</li> <li>2. to acquaint with experimental methods for determination of strength and physical properties of building materials as well as load carrying capacity and deformability of structural elements</li> <li>3. to enable acquiring knowledge in the field of independent experimental research and measurement techniques used</li> </ol>																																
<b>Learning outcomes</b>	<p>After completing the course PhD student can:</p> <ol style="list-style-type: none"> <li>1. collect and use the current state of knowledge and critically evaluate the results of previous research - effects W4, K1</li> <li>2. independently prepare the experimental research programme (selection of shape, size and number of test specimens, arrangement of the reinforcement, design of concrete mix) - effects W4, U4</li> <li>3. design the test setup (selection of static system and equipment of the test setup - supports, actuators) - effects W4, U4</li> <li>4. manage destructive test with participation of trained technical staff - effect W4</li> <li>5. make a selection of measuring techniques appropriate for the assumed research purpose (design of the location of selected sensors - strain gauges, linear variable differential transducers, digital image correlation system, etc.) - effects W4, U4, K1</li> <li>6. interpret and critically assess the test results and measurements carried out - effect K1</li> </ol>																																
<b>Assessment methods</b>	<p>Effects W4, U4, K1 - elaboration of the exercise report and presentation</p> <p>The final grade consists of:</p> <p>Report and presentation - 100%</p>																																
<b>Prerequisites</b>	none																																

<b>Course content with delivery methods</b>	<p>PROJECT:</p> <p>The course participants will be ordered to collect information on the research techniques used, including their scope, advantages and limitations. The task of the group of students will consist in design an experimental research of a selected structural element in terms of analysis of the parameter specified by course instructor. The students' task would be to:</p> <ul style="list-style-type: none"> <li>- design the test setup (selection of static system and equipment - supports, actuators)</li> <li>- develop the concept of application of selected measuring techniques (design of the location of selected measuring sensors - strain gauges, linear variable differential transformers, etc.)</li> <li>- participate in an experimental (destructive) test of the element / elements under the supervision of an employee</li> <li>- verify the test results in the light of the current state of knowledge</li> </ul>
<b>Basic reference materials</b>	<ol style="list-style-type: none"> <li>1. Reports from the series: Experimental testing of elements and concrete structures. Department of Concrete Structures, Lodz University of Technology, Poland</li> <li>2. Specialized Technical Journals: Structural Concrete, Magazine of Concrete Research, Engineering Structures, ACI Structural Journal, Beton und Stahlbetonbau</li> </ol>
<b>Other reference materials</b>	<ol style="list-style-type: none"> <li>1. Emerson, L.; Hampton, J. Writing Guidelines for Science and Applied Science Students, 2nd ed.; Thomson/Dunmore Press: Southbank, Vic., 2005.</li> <li>2. Standards: <ul style="list-style-type: none"> <li>▪ EN 206+A2:2021-08 Concrete - Specification, performance, production and conformity</li> <li>▪ EN 12390-1:2021-12 Testing hardened concrete - Part 1: Shape, dimensions and other requirements for specimens and moulds</li> <li>▪ EN 12390-2:2019-07 Testing hardened concrete - Part 2: Making and curing specimens for strength tests</li> <li>▪ EN 12390-3:2019-07 Testing hardened concrete - Part 3: Compressive strength of test specimens</li> <li>▪ EN 12390-5:2019-08 Testing hardened concrete - Part 5: Flexural strength of test specimens</li> <li>▪ EN 12390-6:2011 Testing hardened concrete - Part 6: Tensile splitting strength of test specimens</li> <li>▪ EN 12390-7:2019-08 Testing hardened concrete - Part 7: Density of hardened concrete</li> <li>▪ EN 12504-1:2019-08 Testing concrete in structures - Part 1: Cored specimens - taking, examining and testing in compression</li> <li>▪ EN 12504-2:2021-12 Testing concrete in structures - Part 2: Non-destructive testing - determination of rebound number</li> <li>▪ EN 12504-4:2021-12 Testing concrete - Part 4: Determination of ultrasonic pulse velocity</li> <li>▪ EN 13791:2019-12 Assessment of in-situ compressive strength in structures and precast concrete components</li> <li>▪ EN 1992-1-1:2004 + Ap:2015 Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings</li> </ul> </li> <li>2. Reports of German Committee for Structural Concrete (DAfStb)</li> <li>3. <i>fib</i> Bulletins</li> <li>4. Other standard regulations (eg. Eurocode, Model Code, ACI Standard)</li> </ol>
<b>Average student workload outside classroom</b>	10h
<b>Comments</b>	Classes can take place in groups of up to 5 participants
<b>Last update</b>	Brak informacji