

<b>Course title:</b> Physics / Building Chemistry				
<b>Identification number</b>	<b>ECTS credits</b>	<b>Duration of the module</b>	<b>Intended study semester</b>	<b>Frequency of the course</b>
	4	One Semester	1. Semester	Each Semester
<b>Workload (total) (h)</b>		<b>Contact time (h)</b>	<b>Self-study (h)</b>	
120		60	60	
<b>Language</b>		<b>Planned group size</b>	<b>Compulsory or elective</b>	
English		20 Students	Compulsory Module	
<b>Module coordinator</b>		<b>Course(s) (with focus/module group if applicable)</b>		
Dr. Arda Öcal		Physics / Building Chemistry		
<b>1.</b>	<b>Qualification goals/competences/learning outcomes</b>			
	After completing the module, students will be able to:			
	<ul style="list-style-type: none"> <li>describe and analyze various physical phenomena using the principals and laws of Newtonian mechanics.</li> <li>solve physical problems based on these principles and laws in mechanics.</li> <li>understand the basic principles and laws of chemistry and apply them to building materials.</li> </ul>			
<b>2.</b>	<b>Contents</b>			
	<ul style="list-style-type: none"> <li>The lecture Physics / Building Chemistry covers the following topics:</li> <li>Physics</li> <li>Kinematics: Coordinates and vectors, velocity and acceleration, superposition of motions, projectile motion, translational- and rotational motions.</li> <li>Dynamics: Newton's laws, mechanical forces, equilibrium of forces and moments, stress and pressure, hooke's law and elastic oscillations, mechanical work, energy, power, law of conservation of energy, momentum and conservation of momentum law, rotational motion, angular momentum, and conservation of angular momentum.</li> <li>Physical material properties: Density, bulk density, stress, pressure, shear stress, stress-strain diagram, Young's modulus, shear modulus G, transverse strain, Poisson's ratio, relationship between elastic constants.</li> <li>Building Chemistry</li> <li>Basics: Elements, structure of the electron shell of an atom, periodic table, chemical bonding.</li> <li>Chemistry of water: PH value, acids, bases, water in construction.</li> <li>Construction metals and corrosion: Iron and steel, types of corrosion, non-ferrous metals, corrosion protection.</li> <li>Inorganic binders and their hardening reactions: Gypsum, lime, sand-lime and lightweight lime concrete (aerated concrete) blocks, cement.</li> </ul>			

	<ul style="list-style-type: none"> <li>• Concrete corrosion</li> <li>• Bitumen and plastics</li> </ul>
<b>3.</b>	<b>Teaching methods</b> Lecture
<b>4.</b>	<b>Participation requirements</b> /
<b>5.</b>	<b>Regulations on attendance</b> /
<b>6.</b>	<b>Examination type and scope</b> Written Final Exam (120 Minutes) <b>Course test as a prerequisite for participation in the exam</b> /
<b>7.</b>	<b>Requirements for the awarding of credit points (ECTS)</b> Passed exam Physics / Building Chemistry
<b>8.</b>	<b>Applicability of the module (in other degree programmes)</b> Bachelor's degree programme International Civil Engineering
<b>9.</b>	<b>Importance of the grade for the final grade</b> 4/194
<b>10.</b>	<b>Literature references</b> <ul style="list-style-type: none"> <li>• Lecture Notes in OLAT</li> <li>• 10 problem sheets with solutions on OLAT</li> <li>• Physics, Pearson, Boston, 2015</li> <li>• Fundamentals of Physics, Wiley, Hoboken, 2013</li> <li>• Gaffney J.F. and Marley N.A., General Chemistry for Engineers, Elsevier 2018:</li> </ul>
<b>11.</b>	<b>Other information</b> /
<b>12.</b>	<b>Last edited</b> 13.12.24