

4.00 credits

20.0 h + 30.0 h

Q2

Teacher(s)	Sgambi Luca ;
Language :	French
Place of the course	Tournai
Prerequisites	<i>The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.</i>
Main themes	This teaching unit forms part of the continuous process of learning about structures and their behaviour. <ul style="list-style-type: none"> <li>• Eurocodes</li> <li>• Loads, overloads and combinations of actions and stress</li> <li>• Ultimate and serviceability limit states</li> <li>• Structures in masonry</li> <li>• Structures in concrete and reinforced concrete</li> </ul>
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p><b>Specific learning outcomes:</b> By the end of the course, students will be able to</p> <ul style="list-style-type: none"> <li>• understand and put forward a structural logic for a building.</li> <li>• understand and carry out lowering the loads in a building to the foundations.</li> <li>• understand the behaviour of a material according to its environment.</li> <li>• understand the approach to structures in reinforced concrete.</li> <li>• understand the technical documents linked to structures in reinforced concrete.</li> </ul> <p><b>Contribution to the learning outcomes reference framework:</b></p> <p>1 With regard to the learning outcomes reference framework of the Bachelor's degree in Architecture, this teaching unit contributes to the development, the acquisition and the assessment of the following learning outcomes:</p> <p><b>Make use of other subjects</b></p> <ul style="list-style-type: none"> <li>• Make use of other subjects to ask questions about the design and implementation of an architectural project</li> </ul> <p><b>Use the technical dimension</b></p> <ul style="list-style-type: none"> <li>• Observe and assess the main construction principles of a building</li> <li>• Be able to apply the various basic technical principles in a producing a work of architecture</li> </ul>
Evaluation methods	Each student's final rating is the average of two ratings. The first evaluation concerns a structural design work on a design problem assigned by the teacher at the beginning of the course. This work can be done in groups. The second evaluation concerns a written examination on the topics carried out in the classroom. On both assessments, the teacher sets a minimum threshold of 6/20 below which the student cannot have a positive final assessment. Due to the current health crisis, the written exam could be conducted in the presence or online, or it could be replaced with an oral examination (online).
Teaching methods	The preferred form of teaching is in presence. However, due to the current health crisis, the course may take place in co-modal mode or totally online.
Content	<p><b>Structural analysis</b></p> <ul style="list-style-type: none"> <li>- Reminders on the analysis of isostatic structures</li> <li>- General information on hyperstatic structures</li> <li>- Calculation of hyperstatic structures (method of forces)</li> <li>- Load combinations and envelope diagrams</li> </ul> <p><b>Design of reinforced concrete structures</b></p> <ul style="list-style-type: none"> <li>- Ultimate limit states and service limit states</li> <li>- General information on reinforced concrete</li> <li>- Tension and compression</li> <li>- Pure bending</li> </ul>

	<ul style="list-style-type: none"> <li>- Shear forces</li> <li>- Bending and compression</li> </ul> <p>Each part, relating to the design of reinforced concrete structures, will also include an explanation of construction details and real-life examples. For each topic, similar elements designed in precast reinforced concrete will be presented.</p>
Bibliography	<p>Allen E., Zalewski W., Form and Forces, Designing efficient, expressive structures, Boston, Wiley, 2010</p> <p>Muttoni A., L'art des structures, Lausanne, PPUR, 2004</p> <p>Salvadori M., Comment ça tient ?, Editions Parenthèses, 2005</p> <p>Studer M-A. &amp; Frey Fr., Introduction à l'analyse des structures, Lausanne, PPUR, 1997</p> <p>Schodek D., Bechthold M., Structures, sixth edition, Pearson Prentice Hall, 2008</p> <p>Gordon J., Structures et matériaux, Pour la science, Belin, 1994</p>
Other infos	<p>More detailed information about the course and evaluation procedures will be explained during the first lesson and will be contained in the "Plan du cours" (downloadable from MOODLE).</p>
Faculty or entity in charge	<p>LOCI</p>

**Programmes containing this learning unit (UE)**

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Architecture (Tournai)	ARCT1BA	4	LTARC1261 AND LTARC1262	