






This learning unit is not being organized during this academic year.

Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Learning outcomes	
Evaluation methods	<p>Your performance is evaluated throughout the semester and through different means, as per the calendar below:</p> <ul style="list-style-type: none"> <li>• <b>Case study of parametric building:</b> Due week 3: individually, prepare one A3 landscape poster of a building designed parametrically, presenting the outcome and the design process, with a critique of the building. <b>(20%)</b></li> <li>• <b>Parametric Design Plan:</b> Due week 6: draft report, describing your parametric design approach and how you intend to proceed <b>(mandatory, 0%)</b></li> <li>• <b>Peer-review of Parametric Design Plan:</b> Due week 7, 500 words peer-review of the <i>Parametric Design Plan</i> of one of your peers <b>(10%)</b></li> <li>• <b>Parametric Design Report:</b> Due week 12, 4000 words report describing your parametric design approach, and including the digital files, to be submitted online <b>(55%)</b></li> <li>• <b>Parametric Design Presentation:</b> Last week of the semester, In-person presentation about the report and the parametric design approach followed by questions and answers <b>(15%)</b></li> </ul>
Teaching methods	<p>The subject is organised into 12 weekly seminars of 3 hours each. The seminars are held <b>online</b> to facilitate participation across campuses. <b>Students are required to attend the seminar in person three times during the semester, in Brussels/ St Gilles (first week, week 9 and last week).</b></p>
Content	<p><b>Description</b></p> <p>This course aims to equip you with the knowledge and skills to plan, devise, implement and revisit a parametric building design for a given site and for a range of environmental and construction-related considerations. The course uses Rhinoceros 3D and Grasshopper as well as other plug-ins to equip you with the necessary experience in parametric design. The course is taught fully in <b>English</b>.</p> <p><b>Main themes</b></p> <ul style="list-style-type: none"> <li>• Theory of parametric design</li> <li>• Parametrising 3D modelling</li> <li>• Grasshopper</li> <li>• Environmental design (climate analysis, bioclimatic design, embodied environmental flows modelling)</li> <li>• Intro to optimisation: Constraints and objectives</li> <li>• Reflexivity in parametric design</li> </ul> <p><b>Learning outcomes</b></p> <p>At the end of this course, you will be able to:</p> <ol style="list-style-type: none"> <li>1. Plan, devise, implement, test, revisit and critique a parametric design for a given building;</li> <li>2. Embed a range of constraints and objectives into the parametric environmental design of a building;</li> <li>3. Present your work in a concise and graphically stimulating manner;</li> <li>4. Provide constructive feedback to your peers to help them improve their work; and</li> <li>5. Demonstrate awareness vis-à-vis the latest international developments in parametric architecture and design.</li> </ol> <p><b>Prerequisites</b></p>

	A good of command of English, both written and spoken (level B2 at least).
Inline resources	See the course on Moodle
Bibliography	<p><b>Parametric Design in Rhino and Grasshopper:</b></p> <ul style="list-style-type: none"> <li>• Tedeschi, A. (2014). <i>AAD, Algorithms-aided design: parametric strategies using Grasshopper</i>. Le Penseur.</li> <li>• Di Marco, G. (2018). <i>Simplified Complexity: Method for Advanced NURBS Modeling with Rhinoceros®</i>. Le Penseur.</li> </ul> <p><b>Environmental Parametric Design:</b></p> <ul style="list-style-type: none"> <li>• Hollberg, A., &amp; Ruth, J. (2016). LCA in architectural design—a parametric approach. <i>The International Journal of Life Cycle Assessment</i>, 21(7), 943-960. doi:10.1007/s11367-016-1065-1</li> <li>• Stephan, A., Jensen, C. A., &amp; Crawford, R. H. (2017). Improving the Life Cycle Energy Performance of Apartment Units through Façade Design. <i>Procedia Engineering</i>, 196, 1003-1010. doi: <a href="https://doi.org/10.1016/j.proeng.2017.08.042">https://doi.org/10.1016/j.proeng.2017.08.042</a></li> <li>• Stephan, A., &amp; Crawford, R. H. (2016). The relationship between house size and life cycle energy demand: Implications for energy efficiency regulations for buildings. <i>Energy</i>, 116, Part 1, 1158-1171. doi: <a href="http://dx.doi.org/10.1016/j.energy.2016.10.038">http://dx.doi.org/10.1016/j.energy.2016.10.038</a></li> </ul> <p><b>Relevant websites:</b></p> <ul style="list-style-type: none"> <li>• <a href="https://parametric-architecture.com/">https://parametric-architecture.com/</a></li> <li>• <a href="https://parametrichouse.com/">https://parametrichouse.com/</a></li> <li>• <a href="https://grasshopperdocs.com/">https://grasshopperdocs.com/</a></li> <li>• <a href="https://www.ladybug.tools/">https://www.ladybug.tools/</a></li> </ul> <p><b>Academic conferences on parametric design:</b></p> <ul style="list-style-type: none"> <li>• <a href="http://ecaade.org/">http://ecaade.org/</a></li> <li>• <a href="https://www.caadria.org/">https://www.caadria.org/</a></li> </ul>
Faculty or entity in charge	LOCI

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Civil Engineering	<a href="#">GCE2M</a>	3		
Master [120] in Architecture (Tournai)	<a href="#">ARCT2M</a>	3		
Master [120] in Architecture (Bruxelles)	<a href="#">ARCB2M</a>	3		
Master [120] in Architecture and Engineering	<a href="#">ARCH2M</a>	3		