



Teacher(s)	Stephan André ;
Language :	French
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"> • Case study of parametric building: 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. (20%) • Parametric Design Plan: Due week 6: draft report, describing your parametric design approach and how you intend to proceed (mandatory, 0%) • Peer-review of Parametric Design Plan: Due week 7, 500 words peer-review of the <i>Parametric Design Plan</i> of one of your peers (10%) • Parametric Design Report: Due week 12, 4000 words report describing your parametric design approach, and including the digital files, to be submitted online (55%) • Parametric Design Presentation: Last week of the semester, In-person presentation about the report and the parametric design approach followed by questions and answers (15%)
Teaching methods	<p>The subject is organised into 12 weekly seminars of 3 hours each.</p> <p>The seminars are held online to facilitate participation across campuses.</p> <p>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).</p>
Content	<p>Description</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.</p> <p>The course is taught fully in English.</p> <p>Main themes</p> <ul style="list-style-type: none"> • Theory of parametric design • Parametrising 3D modelling • Grasshopper • Environmental design (climate analysis, bioclimatic design, embodied environmental flows modelling) • Intro to optimisation: Constraints and objectives • Reflexivity in parametric design <p>Learning outcomes</p> <p>At the end of this course, you will be able to:</p> <ol style="list-style-type: none"> 1. Plan, devise, implement, test, revisit and critique a parametric design for a given building; 2. Embed a range of constraints and objectives into the parametric environmental design of a building; 3. Present your work in a concise and graphically stimulating manner; 4. Provide constructive feedback to your peers to help them improve their work; and 5. Demonstrate awareness vis-à-vis the latest international developments in parametric architecture and design. <p>Prerequisites</p> <p>A good of command of English, both written and spoken (level B2 at least).</p>

Inline resources	See the course on Moodle
Bibliography	<p>Parametric Design in Rhino and Grasshopper:</p> <ul style="list-style-type: none"> • Tedeschi, A. (2014). <i>AAD, Algorithms-aided design: parametric strategies using Grasshopper</i>. Le Penseur. • Di Marco, G. (2018). <i>Simplified Complexity: Method for Advanced NURBS Modeling with Rhinoceros®</i>. Le Penseur. <p>Environmental Parametric Design:</p> <ul style="list-style-type: none"> • Hollberg, A., & 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 • Stephan, A., Jensen, C. A., & Crawford, R. H. (2017). Improving the Life Cycle Energy Performance of Apartment Units through Façade Design. <i>Procedia Engineering</i>, 196, 1003-1010. doi: https://doi.org/10.1016/j.proeng.2017.08.042 • Stephan, A., & 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: http://dx.doi.org/10.1016/j.energy.2016.10.038 <p>Relevant websites:</p> <ul style="list-style-type: none"> • https://parametric-architecture.com/ • https://parametrichouse.com/ • https://grasshopperdocs.com/ • https://www.ladybug.tools/ <p>Academic conferences on parametric design:</p> <ul style="list-style-type: none"> • http://ecaade.org/ • https://www.caadria.org/
Faculty or entity in charge	LOCI

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Architecture (Tournai)	ARCT2M	3		
Master [120] in Architecture and Engineering	ARCH2M	3		
Master [120] in Architecture (Bruxelles)	ARCB2M	3		