UCLouvain

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2020

Parametric Design

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).

3 credits	30.0 h	Q2

Teacher(s)	Stephan André ;
Language :	English
Place of the course	Bruxelles Saint-Gilles
Main themes	Theory of parametric design 3D modelling in Rhinoceros Parametrising 3D modelling Grasshopper Intro to optimisation: Constraints and objectives Environmental design Reflexivity in parametric design
Aims	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. At the end of this course, you will be able to: 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. - - - - *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** The course content is evaluated throughout the semester and through different means, as per the calendar below: • **Case study of parametric building**: Due week 3: in groups of 2 students, prepare one A3 landscape poster of a building designed parametrically, presenting the outcome and the design process, with a critique of the building**. (10%)** • **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 750 words peer-review of the *Parametric Design Plan* 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 **(60%)** • **Parametric Design Presentation**: Presentation about the report and the parametric design approach followed by questions and answers **(20%)**
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** This course relies on an active learning approach. As such, teaching is delivered in 3 hours seminars involving an active lecture, discussion and in-class tutorials. The subject requires 30 contact hours and at least 60 hours of work outside class

Bibliography	Une liste écourtée est présentée ici (des lectures plus spécifiques sont données en classe) : **Design paramétrique avec Rhino et Grasshopper :** Tedeschi, A. (2014). *AAD, Algorithms-aided design: parametric strategies using Grasshopper*: Le Penseur. Di Marco, G. (2018). *Simplified Complexity: Method for Advanced NURBS Modeling with Rhinoceros®*: Le Penseur. **Design paramétrique environnemental :** Hollberg, A., & Ruth, J. (2016). LCA in architectural design—a parametric approach. *The International Journal of Life Cycle Assessment, 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. *Procedia Engineering, 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. *Energy, 116, Part 1*, 1158-1171. doi: http://dx.doi.org/10.1016/j.energy.2016.10.038
Faculty or entity in charge	LOCI

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