# UCLouvain

## lgciv2011

### 2018

# Project 1

| 7 credits | 37.5 h + 40.0 h | Q1 |
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| Teacher(s) | Latteur Pierre coordinator ;Pardoen Benoît ;Pelsser Yvette ;Vandenbergh Thomas ;Zastavni Denis ; |
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| Language : | English |
| Place of the course | Louvain-la-Neuve |
| Prerequisites | This project requires in-depth knowledge of structural materials, mechanics of structures, stability of structures, soil mechanics, basic construction methods and reinforced concrete structures, as taught in the following courses: LGCIV1031, LGCIV1022, LGCIV1072 , LGCIV1023, LGCIV1032.<br><br>*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.* |
| Main themes | This project, carried out by groups of several students, aims to place the student in the context of the study and design of a concrete multi-storey building, by passing through the main stages that characterize the design of such a building, including architectural design and finishing. This is done with the use of REVIT software allowing the BIM (Building Information Management) approach |
| Aims | With reference to the AA reference framework of the "Master Civil Engineer of Constructions" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes:<br>AA1.1, AA1.2, AA1.3, AA2.1, AA2.2, AA2.3, AA2.4, AA2.5, AA4.1, AA4.2, AA4.3, AA4.4, AA5.1, AA5.2, AA5. 3, AA5.4, AA5.5, AA5.6, AA6.1, AA6.2, AA6.3, AA6.4<br>More specifically, at the end of this course, the student must be able to:<br><br>• Apply the general rules of structural and architectural design of a multi-storey building (choice of horizontal and vertical load-bearing systems depending on the spans, loads, wind bracing, expansion joints, etc);<br>• Choose a foundation system according to characteristics soil;<br>• Design structural elements such as cast-in-place or prefabricated slabs, prestressed slabs, beams, columns and walls made of reinforced concrete, pre-slabs and pre-walls, metal beams and roofs, surface or deep foundations, etc. ;<br>• Choose the types of covers and finishing with the help of commercial documentation ;<br>• Master the functionalities of a BIM (Revit) software: integrate the geometric characteristics of a simple building, deduce a measurement, integrate a planning and calculate a price.<br><br>- - - -<br>*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 | The evaluation will be based on:<br><br>• The regular work of the students and their attendance during the workshops;<br>• The final presentation of the project (associated with a detailed report and plans to be provided), by group, in the presence of other students. |
| Teaching methods | Ex-cathedra courses with slides and BIM demonstrations for volume 1. Workshops for volume 2. |
| Content | **Volume 1 will focus on the basics needed to complete the project:**<br><br>• General introduction on BIM;<br>• Learning a BIM software (Revit);<br>• Architectural design;<br>• General design of buildings and structural design rules;<br>• Reminders of design and calculation of superficial and deep foundations.<br><br>**Volume 2 will focus on the project itself (workshops):**<br><br>• Specifications and building programme, geographical context, characteristics of the land, neighbourhood, access roads, type of occupation, number of floors requested, etc. ;<br>• General architectural and structural design of the building and first sketch, specific to each group of students;<br>• Establishment of a refined sketch of the building with a software allowing the approach BIM (Revit);<br>• Choice of a structural system and the type of foundations;<br>• Design of the structural elements (beams, columns, slabs, walls, etc);<br>• Design of the foundations;<br>• Reinforcement plans and formwork plans on A0 format;<br>• Refinement of the BIM model and initial sketches; |

|  | • Choice of the finishing (roofs and facades);<br>• Measurements and estimation of the cost of the building, using the BIM model;<br>• Building schedule (using the BIM model). |
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| Inline resources | Available on Moodle |
| Bibliography | • Transparents du cours ;<br>• Traité de génie civil de l'Ecole Polytechnique fédérale de Lausanne ;<br>• Tutorial BIM (fourni dans le cadre du projet) ;<br>• Documentation commerciale relative à des produits de construction (hourdis, prédalles, parachèvements, couvertures, etc). |
| Faculty or entity in charge | GC |

## Programmes containing this learning unit (UE)

| Program title | Acronym | Credits | Prerequisite | Aims |
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| Master [120] in Civil Engineering | GCE2M | 7 | | 🔍 |
| Master [120] in Architecture and Engineering | ARCH2M | 7 | LGCIV1032B | 🔍 |