UCLouvain

larct1262

2026

Assembly: Construction and Structure

5.00 credits	40.0 h + 15.0 h	Q2

Teacher(s)	Sgambi Luca ;
Language :	French
Place of the course	Tournai
Prerequisites	*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 course addresses the key aspects of construction using concrete, timber, and steel. It introduces the technologies associated with these primary structural materials, enabling students to make informed structural choices while considering their constructive and structural implications. The course trains students to integrate various constructive and structural constraints, particularly in situations involving the intersection of walls or the assembly of multiple structural elements, to design appropriate and effective constructive details.
Learning outcomes	**At the end of this learning unit, the student is able to :** **Specific Learning Outcomes** By the end of this course, students will be able to: • Describe the behavior and constructive arrangements of the main structural materials within their environment, • Design a structure by considering the properties and behavior of the material as well as possible assembly methods, • Explain the principles of dimensioning reinforced concrete, timber, and metal structures, and evaluate their performance, • Analyze and propose a basic construction detail for the connection of multiple walls, addressing various constructional and structural requirements, • Critically evaluate specific technical documents, • Communicate effectively with the structural engineer and other stakeholders involved in the construction process. **General Learning Outcomes** In line with the program's learning outcomes (LOs), this course contributes to the development and acquisition of the following LOs: • LO2.4 Proficiently illustrate construction logics. • LO3.1 Acquire and explain the physical and physiological principles related to architecture. • LO3.2 Acquire and explain the construction and technical processes related to architecture. • LO3.3 Acquire and apply scientific and technical knowledge to realize an architectural project. • LO3.4 Acquire and explain the environmental, social, and economic consequences of construction and technical choices.
Evaluation methods	Each student's final grade is the average of two grades. The first assessment is based on a structured design project, which is assigned by the instructor at the beginning of the course (6 points out of 20). This project may be done in groups. The second assessment is a written exam on the topics covered in class (14 points out of 20). Please note that in order to succeed in the course, students must obtain **at least 7 out of 14 points in the written exam** , independent of the grade for the structural design project grade.
Teaching methods	The course includes a portion of theoretical lectures, a portion of the course devoted to exercises, and the development of a structural design exercise.
Content	Structural analysis - Review of isostatic structure analysis - General information on hyperstatic structures - Example of a solution for a hyperstatic structure (force method) - Use of charts and Excel for solving hyperstatic beams Introduction to European construction standards (Eurocodes) - Ultimate limit states and serviceability limit states - Safety coefficients for loads and materials - Load combinations and envelope diagrams Design of steel structures

	- Steel as a material - Reminder of structural organization for steel constructions - Dimensioning of tensioned, compressed, and bent elements - Assembly joints - Example of structural design for a steel building Design of reinforced concrete structures - Concrete as a material - Reminder of structural organization for reinforced concrete constructions - Dimensioning of compressed and bent elements - Assembly joints - An example of structural design for a reinforced concrete building Design of wooden structures - Wood as a material - Reminders of structural organization for wooden constructions - Dimensioning of compressed and bent elements - Assembly joints - An example of structural design for a wooden building
Inline resources	To support the course, the professor makes MOODLE modules available that cover all the topics discussed.
Faculty or entity in charge	LOCI

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Architecture (Tournai)	ARCT1BA	5	LARCT1161 AND LARCT1162	🔍