

4.00 credits


20.0 h + 15.0 h

Q2

Teacher(s)	Latteur Pierre ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	Very good knowledge in the following fields: <ul style="list-style-type: none"> • Behaviour of structural materials, as taught in course LGCIV1031; • Resistance of materials and mechanics of structures, as taught in the course LGCIV1022; • Stability of constructions, as taught in course LGCIV1023;
Main themes	See chapter "Content" hereunder
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <p>AA1.1, AA1.2, AA1.3, AA2.1, AA2.2, AA2.3, AA2.4</p> <p>At the end of this course, the students must be able to:</p> <ol style="list-style-type: none"> 1. <ul style="list-style-type: none"> • Choose the timber material knowingly, according to its advantages, disadvantages, and specificities of structural design; • Design the structural elements subjected to all the combinations of loads (N, M, V, T) by applying the rules of the EC5; • Design and calculate simple carrier systems; • Design and calculate simple connections; • Integrate the fire problem in the design
Evaluation methods	<p>The examination is closed book and will consist of a part of about one hour concerning the theoretical notions of the course and an exercise part of about 2 hours with practical problems to solve. Failure in either part will result in a final grade of less than 10/20 (both parts must be passed). For the exercise part, students can only have a handwritten personal summary on a single sheet of A4 paper, double-sided.</p> <p>The evaluation will cover all parts of the course. The chapters related to the calculation of internal forces and the drawing of internal force diagrams in wood structures will have to be perfectly mastered. In addition, a good overall knowledge of the theoretical aspects of the course is necessary for success.</p>
Teaching methods	Ex-cathedra courses and/or podcasts, alternating theory and exercises.
Content	<p>IMPORTANT NOTE: IN CASE OF FORCE MAJEURE (E.G., AN EPIDEMIC), THE CONTENT, ACTIVITIES, TEACHING METHODS AND EVALUATION METHODS MAY BE ADAPTED</p> <p><u>Part 1: The wood material</u></p> <p>Chapter 1: Trees, the forest, the context of wood production Chapter 2: A Brief History of Wood Construction Chapter 3: Advantages and disadvantages of wood in construction Chapter 4: Wood Anatomy Chapter 5: Wood, Temperature and Water Chapter 6: Wood Durability: Preservation, Finishing, Design Chapter 7: Mechanical properties of wood</p> <p><u>Part 2: ELU and ELS design criteria</u></p> <p>Chapter 8: Structural elements in solid timber Chapter 9: Structural elements in glue-laminated timber Chapter 10: Actions, cases of charges, combinations of (cases of) charges Chapter 11: Design criteria defined by EC5 Chapter 12: Resistance in section: design criterion ELU Chapter 13: Integration of Buckling into the design criteria Chapter 14: Integration of the lateral torsional buckling into the design criteria Chapter 15: Curved elements in BLC Chapter 16: Variable Inertia Beams</p> <p><u>Part 3: Building systems</u></p>

	<p>Chapter 17: Structural elements derived from wood Chapter 18: Building Systems Chapter 19: Trusses Chapter 20: Cable beams Chapter 21: Continuous beams, cantilever beams Chapter 22: Arches Chapter 23: Frames Chapter 24: Other building systems Chapter 25: Wind bracing Part 4: Design and calculation of timber connections Chapter 26: General Chapter 27: Traditional Assemblies (Timber to Timber) Chapter 28: Metal Rods and Connectors Chapter 29: Johansen Theory, design according to EC5 Chapter 30: Bolted Assemblies Chapter 31: Broached, Nailed and Screwed Assemblies Chapter 32: Rigidity of assemblies, ELS calculations Part 5: Timber and fire Chapter 33: General and Belgian regulations Chapter 34: Calculation of REI aspects according to EC5 (part 1.2)</p>
Inline resources	<p>See MOODLE page of the course (slides and syllabus of solved exercises). Podcasts available on : https://www.youtube.com/channel/UCvqPgjqATFrps2zA3PIRAMQ</p>
Bibliography	<p>Voir page MOODLE du cours.</p>
Other infos	<p>See MOODLE page of the course.</p>
Faculty or entity in charge	<p>GC</p>

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Civil Engineering	GCE2M	4		
Master [120] in Architecture and Engineering	ARCH2M	4		