


4 credits

20.0 h + 15.0 h

Q2

Teacher(s)	Doneux Catherine ;Latteur Pierre ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	See chapter "Content" hereunder
Aims	<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 • 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 <p>-----</p> <p><i>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".</i></p>
Evaluation methods	<p>Exam of about an hour, about the theoretical concepts of the course (PART I) + exam of about 3 hours with practical problems to solve (PART II). For the PART II exam, students can only have a personal handwritten summary on a single, double-sided A4 sheet.</p> <p>The success of both parties is required. If one of the two parties is in failure, the resulting score will be the minimum between the average score and 9/20.</p> <p>An eliminatory question on very basic aspects of the course can be provided at the beginning of the exam. The final score will be 0/20 if this eliminatory question is not successful.</p>
Teaching methods	Ex-cathedra teaching with the help of slides for the volume 1. Practical works with the assistants for the volume 2.
Content	<p><u>Part 1: The wood material</u></p> <p>Chapter 1: Trees, the forest, the context of wood production</p> <p>Chapter 2: A Brief History of Wood Construction</p> <p>Chapter 3: Advantages and disadvantages of wood in construction</p> <p>Chapter 4: Wood Anatomy</p> <p>Chapter 5: Wood, Temperature and Water</p> <p>Chapter 6: Wood Durability: Preservation, Finishing, Design</p> <p>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</p> <p>Chapter 9: Structural elements in glue-laminated timber</p> <p>Chapter 10: Actions, cases of charges, combinations of (cases of) charges</p> <p>Chapter 11: Design criteria defined by EC5</p> <p>Chapter 12: Resistance in section: design criterion ELU</p> <p>Chapter 13: Integration of Buckling into the design criteria</p> <p>Chapter 14: Integration of the lateral torsional buckling into the design criteria</p> <p>Chapter 15: Curved elements in BLC</p> <p>Chapter 16: Variable Inertia Beams</p> <p><u>Part 3: Building systems</u></p> <p>Chapter 17: Structural elements derived from wood</p> <p>Chapter 18: Building Systems</p> <p>Chapter 19: Trusses</p> <p>Chapter 20: Cable beams</p> <p>Chapter 21: Continuous beams, cantilever beams</p> <p>Chapter 22: Arches</p> <p>Chapter 23: Frames</p>

	<p>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	Available on Moodle
Bibliography	<ul style="list-style-type: none"> • Transparents du cours et syllabus d'exercices résolus, téléchargeables sur http://www.issd.be/CoursLateur.html; • Syllabus conseillé : Dimensionnement et technologie des structures en bois, introduction à l'EC5, volumes 1 et 2, janvier 2014, Faculté Polytechnique de Mons ; • Livre suggéré : Traité de Génie Civil de l'Ecole polytechnique de Lausanne : volume 12.
Faculty or entity in charge	GC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Civil Engineering	GCE2M	4		
Master [120] in Architecture and Engineering	ARCH2M	4		