CU 8.2: TIMBER CONSTRUCTION

Director of studies: **Laurent BLERON**

General CU objectives:

Building directly on CU 6.4, this unit will provide the knowledge required to accurately size connected laminated wood and composite structural elements, beam systems, wood frame structures, and common joints subjected to uni-axial forces in wood and metal.

Information allowing the understanding of contracts and the costing of these solutions will also be provided.

The teaching is intended to be applied and should allow students to learn the main tools for professional sizing.

Consists of:

- Module 1: Wood structures
- Module 2: Wood and metal assemblies
- Module 3: Contracts, price study and construction site
- Industrial assessment

Hourly volume

In-person		*Self-directed study*
36.75 H	**Lectures**	**81.00 H**
54.00 H	**Tutorials**	
0.00 H	**Practicals**	

Positioning of the CU in the School reference system:

after CU 6.4

Units of skills

In accordance with the RNCP sheet

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Module 1: Wood structures	**Coefficient 2**
Session leaders: Jérôme ROBIN, Etienne LEROY, Rémi COMTE, Frédéric GABRYSIAK, Rémi SENNEPIN	
Teaching assistants:	
Prerequisites: Knowledge of Eurocodes 0, 1 and 5 on the sizing of straight components	
Teaching materials: Course notes – Presentation slides	
Assessment methods: individual Class assignment	

Learning outcomes	**Description**	**Number of student hours (in-person)**		
		Lectures	**Tutorials**	**Practicals**
Understand the specifics of the dimensioning of variable inertia glued laminated wood components. Understand the principles of stabilising wood structures. Understand the implementation and modelling of wood structures through the use of commercial software.	Single decreasing, curved and double decreasing Glulam wood components:	5.25	10.00	
	Wood frame:	3.50	4.00	
	Stability of buildings:	3.50	6.00	
	Use of professional software: Firm sizing– rigidity matrix ACORD beam structure sizing ACORD wood frame sizing ACORD simple component sizing		12.00	
		12.25	**32.00**	**0.00**

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Module 2: Wood and metal assemblies	**Coefficient 2**
Session leaders: Pierre-Olivier COANON, Jérôme ROBIN, Sandrine VORANGER	
Teaching assistants:	
Prerequisites: Static analysis of mechanical systems	
Teaching materials: Course notes – Presentation slides – Project	
Assessment methods: individual Class assignment	

Learning outcomes	**Description**	**Number of student hours (in-person)**		
		Lectures	**Tutorials**	**Practicals**
Understand the theory and principles of sizing assemblies stressed by a normal force or a cutting force. Be able to size an assembly and implement its automatic verification. Understand the basic principles for checking wood-metal assemblies of standard constructions.	Rod type assemblies	5.25		
	Traditional wood-wood blends	3.50		
	Metal assemblies	3.50		
	Rod assemblies: – Bolts, – Crampons, rings, – Screws, – Spikes		10.00	
	Metal assemblies: – Bolting – Welding		4.00	
		12.25	**14.00**	**0.00**

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Module 3: Contracts, price study and construction site	**Coefficient 1**
Session leaders: Patrick PRUVOT, Jean-Marc DEVELOTTE	
Teaching assistants:	
Prerequisites: none	
Teaching materials: Course notes – Presentation slides – Project	
Assessment methods: in groups Report	

Learning outcomes	**Description**	**Number of student hours (in-person)**		
		Lectures	**Tutorials**	**Practicals**
Knowledge of the specificities of public and private procurement. Understand the principles of working in safety in order to integrate these constraints into the design and implementation of a structure. Understand the principles of composing a price. Be able to implement a project costing methodology. Implement a collaborative BIM method	Written contract documents	5.25		
	Site safety, labour code	3.50		
	Price study: Project overview	1.75		
	Project application.		8.00	
	Make the digital model accessible to stakeholders through the deployment of a collaborative platform.	1.75		
		12.25	**8.00**	**0.00**

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Industrial **assessment**	**Coefficient**
Session leaders: Apprentice supervisor (Construction Company)	
Teaching assistants:	
Prerequisites: none	
Teaching materials: Project - Company documents	
Assessment methods: Individual Report	

Learning outcomes	**Description**	**Number of student hours (in-person)**		
		Lectures	**Tutorials**	**Practicals**
Be able to size according to Eurocodes all or part of a timber building and in accordance with national and European regulations.	This project will apply the skills acquired during this course unit to a real-world example. Deliverables will include a structural design report and detailed construction plans. The design report must present the assumptions made (location, altitude, dimensions, load cases, etc.), as well as the specifications of the assembly calculations. The distribution of loads and the stability of the structure will be established either by hand or using the trade-specific software used in the company (ACORD, MD-BAT, etc.). It is requested that the student develop spreadsheets on the parts of their studies that can be reused on other projects . Note: the project must be related to the company's activity.			
		0.00	**0.00**	**0.00**