

5.00 credits

30.0 h + 30.0 h

Q1

Teacher(s)	Frère Hugues (compensates Vincke Caroline) ;Vincke Caroline (coordinator) ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	Introduction in silviculture, plant physiology, organic chemistry, phénomène de transferts, general botany and systematic
Main themes	<ul style="list-style-type: none"> - descriptive anatomy of the wood of gymnosperms and angiosperms and cambial activity ; - comparative anatomy of the main ligneous species from temperate and tropical zones; - wood chemistry and ultrastructure of the cell wall; - wood defects and consequences on wood quality; - physical, thermal, mechanical, acoustical and electrical properties of wood; - wood degradation by physical and biological agents.
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <p>a. Contribution de l'activité au référentiel AA (AA du programme) This course contributes to the learning outcomes AA 1 (Maîtriser un corpus de « savoirs scientifiques » ; en particulier 1.1 à 1.4), 2 (Maîtriser un socle de « savoirs en ingénierie et en gestion » ; en particulier 2.1) et 4 (Concevoir et mettre en oeuvre une démarche complète et innovante d'ingénieur ; en particulier 4.1) of the BIRF program.</p> <p>b. Formulation spécifique pour cette activité des AA du programme (maximum 10) At the end of this course, the student is able to:</p> <p>1</p> <ul style="list-style-type: none"> - identify temperate and tropical ligneous species on the basis of anatomical features observable on small samples and microscopic sections, anatomical elements introduced in the course and illustrated during the practical exercises in laboratory ; - explain and compare wood behavior, on the basis of wood chemistry, wood properties (physical, mechanical), (ultra)structure of the cell wall, in order to optimally valorize this material in the wood processing industry; - identify and explain the influence of growth conditions (silviculture, environment) on wood quality, by integrating the theoretical underlying concepts, in order to adopt a Bioengineer approach aware of the impacts of management on wood quality.
Evaluation methods	The exam on the theoretical part (15 points / 20; 2h or 3h depending on the covid context) is written (closed book exam), and is based on questions which may be of the "definition" type, or focused on theoretical, targeted or transversal development. Indeed, the ability to link the concepts of the different chapters is one of the expected outcomes of the course. A separate exam (5 points / 20; 4h), assesses the students' ability to recognize woody species on the basis of their wood, and is based on the learning from the practical sessions.
Teaching methods	The course is a lecture, with small learning activities (guided questions, quiz) and concrete examples. Depending of wood news and opportunity, invited lecturers may be invited on specific subjects. The practical exercises are organised so as to allow students to integrate and apply progressively the theoretical knowledge.
Content	1. Table of content Introduction <ul style="list-style-type: none"> - Cambial functioning and anatomical elements of softwood and hardwood - Chemistry of the cell wall - Wood specific aspects and defects - Physical properties - Wood and water - Thermal, acoustical and electrical properties - Mechanical properties - Wood damages from biological source
Inline resources	Moodle

Bibliography	Transparents et diapositives fournis en version pdf par l'enseignante via Moodle aux étudiant-e-s inscrit-e-s au cours. Ouvrages de référence : H.A. CORE, W.A. COTE, A.C. DAY - Wood Structure and Identification. Syracuse University Press, 1979 J.C.F. WALKER - Primary Wood Processing - Chapman & Hall, 1993
Other infos	This course can be given in English.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Forests and Natural Areas Engineering	BIRF2M	5		