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5.00 credits

30.0 h + 30.0 h

Q1

Language :	French > English-friendly
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"> <li>- descriptive anatomy of the wood of gymnosperms and angiosperms and cambial activity ;</li> <li>- comparative anatomy of the main ligneous species from temperate and tropical zones;</li> <li>- wood chemistry and ultrastructure of the cell wall;</li> <li>- wood defects and consequences on wood quality;</li> <li>- physical, thermal, mechanical, acoustical and electrical properties of wood;</li> <li>- wood degradation by physical and biological agents.</li> </ul>
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p>a. Contribution de l'activité au référentiel AA (AA du programme)</p> <p>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 and 7.3 (Understand the challenges of sustainable development and situate your career path in the light of these challenges).</p> <p>b. Formulation spécifique pour cette activité des AA du programme (maximum 10)</p> <p>At the end of this course, the student is able to:</p> <p>1 - 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 ;</p> <ul style="list-style-type: none"> <li>- 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;</li> <li>- 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.</li> </ul>
Evaluation methods	<p>The exam takes place in two parts.</p> <p>The theoretical part (the one transmitted during class hours) is a written and closed book examen. Questions can be of the "definition" type, or focused on theoretical development, targeted or cross-cutting. Indeed, the ability to link the concepts of the different chapters is one of the expected achievements of the course. This part of the exam is worth 16/20 points and this exam lasts 3 hours.</p> <p>The learning from the practical sessions is assessed via another exam (duration of 4 hours), in the laboratory room, which assesses the students' ability to recognize woody species on the basis of their wood. This exam is open book and is worth 4 points/20.</p> <p>The final mark of the exam is the sum of the two parts (theoretical and TP).</p> <p>Warning:</p> <ul style="list-style-type: none"> <li>- If the score of the exam of the theoretical part is equivalent to a score less than or equal to 8/20 (or 6.4/16), regardless of the degree of success of the TP exam part, the final score of the examination will be that of the rating of the theoretical part (/20).</li> <li>- Course holders may, under Article 72 of the General Regulations for Studies and Examinations, propose to the jury to oppose the registration of a student who has not participated in at least 70% of classes, during the January/June and/or September session. Attendance at practical sessions is 100% compulsory.</li> </ul>

Teaching methods	<p>The course is given in the form of a lecture, with mini active learning activities (guided and summary questions, quizzes) and concrete and topical examples. External lecturers contribute to this course.</p> <p>The presence of students at this course is required and attendance will be recorded in the auditorium. Course holders may, under article 72 of the General Regulations for Studies and Examinations, propose to the jury to oppose the registration of a student who has not participated in at least 70 % of courses, in the January/June and/or September session. Note that in the event of an external lecturers, attendance at the course is compulsory, out of respect for the professional who travels. The only absences accepted will be those validated by a medical certificate, a case of force majeure, or a time conflict demonstrated to the holders.</p> <p>The supervised practical work in the laboratory (7 sessions of 4 hours) is organized in such a way as to allow the student to gradually integrate and apply theoretical knowledge. 100% attendance of these TPs is mandatory and attendance will be taken. The only absences accepted will be those validated by a medical certificate or a case of force majeure.</p>
Content	<p>1. Table of content</p> <p>Introduction</p> <ul style="list-style-type: none"> <li>- Cambial functioning and anatomical elements of softwood and hardwood</li> <li>- Chemistry of the cell wall</li> <li>- Wood specific aspects and defects</li> <li>- Physical properties</li> <li>- Wood and water</li> <li>- Thermal, acoustical and electrical properties</li> <li>- Mechanical properties</li> <li>- Wood damages from biological source</li> </ul>
Inline resources	Moodle
Bibliography	<p>Powerpoints fournis en version pdf par l'enseignante via Moodle aux étudiant-e-s inscrit-es au cours.</p> <p>Ouvrages de référence :</p> <p>H.A. CORE, W.A. COTE, A.C. DAY - Wood Structure and Identification. Syracuse University Press, 1979</p> <p>J.C.F. WALKER - Primary Wood Processing - Chapman &amp; Hall, 1993</p> <p>TROUY-JACQUEMET M.C. Anatomie du bois, Formation, fonctions et identification. Editions Quae, 2015.</p>
Other infos	<p>This course is given in French.</p> <p>This course is committed to transition and sustainable development.</p>
Faculty or entity in charge	AGRO

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Civil Engineering	GCE2M	5		
Master [120] in Forests and Natural Areas Engineering	BIRF2M	5		