# LBIRF2101

*2015-2016*

# Dendrométrie et inventaires des ressources forestières

| 4.0 credits | 30.0 h + 22.5 h | 2q |
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| Teacher(s) : | Ponette Quentin ; |
| Language : | Français |
| Place of the course | Louvain-la-Neuve |
| Inline resources: | iCampus |
| Prerequisites : | Supplementory courses: The course focuses on ground-based assessment methods. Air-borne methods for natural resource assessment are developed in the courses of geomatics, surveying and photogrammetry. |
| Main themes : | 1. Main concepts:<br>- Definitions, interest, measurement and / or estimation of static characteristics of trees (e.g. diameters, heights, volumes, tree form) and stands (e.g. distributions, density and stocking, productivity and site quality);<br>- Growth of trees and stands: concepts, estimation, production tables, modeling principles;<br>- Complete inventory and sampling methods: (i) basic concepts of sampling, (ii) sampling units, (iii) programming, implementation and processing of inventory results, (iv) inventory methods (e.g. systematic inventory, simple random sampling, point sampling, stratified random sampling, single-stage cluster sampling, double sampling). |
| Aims : | a. Contribution de l'activité au référentiel AA (AA du programme)<br>M1.1, M1.2, M1.4, M2.1, M2.2, M2.4, M3.5, M3.6, M3.7, M3.8, M6.2, M6.5, M6.8,<br><br>b. Formulation spécifique pour cette activité des AA du programme<br>At the end of this course, the student:<br>- knows the principles of operation of the main dendrometric instruments and is able to use them appropriately in the field;<br>- knows how to characterize the trees and stands in terms of stocking and growth;<br>- is able to understand the dynamics of forest stands and to formalize the factors involved in a quantitative way;<br>- knows the main 'tools' used to characterize the growing stock (individual tree, stand) ; is able to use existing tools appropriately, and to build them from raw data;<br>- knows and understands the main methods used to estimate the growth of trees and stands ; is capable to use them in a management context;<br>- knows the principles of sampling and is able to establish appropriate sampling strategies to address a management issue related to forestry, forest management and planning;<br>- is able to formalize and synthesize a forest mensuration analysis in a technical report respecting scientific rigor;<br>*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".* |
| Evaluation methods : | - written examination and evaluation of the report. |
| Teaching methods : | - lectures, including concrete examples, case studies and exercises<br>- realization of a mini-project involving the acquisition of field measurements, a computer-aided processing and the writing of an argued report. This report is illustrated with graphs and tables. |
| Content : | 1. Table of contents<br>Volume of trees<br>- volumes and biomasses<br>- stem form assessment<br>- stem form and volume<br>- log rules<br>- volume tables<br>Tree size and height<br>- tree size<br>concepts<br>measurement<br>- heights<br>concepts<br>measurement<br>Characterization of growing stock<br>- mean characteristics: size, heights, volumes<br>- cumulative variables: basal area, volumes<br>- distributions<br>- relationships between dendrometric characteristics |

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| | dominant height ' age - site fertility<br>total height ' size - age<br>Growth of trees and stands<br>- tree growth<br>size (circumference, radius, diameter, basal area), height and volume increment<br>stem analysis<br>- stand growth<br>repeated stand inventories<br>increment core method<br>applications<br>- introduction to growth models<br>Inventories<br>- fundamentals of sampling<br>context<br>variables, scales, units<br>populations and samples<br>sampling<br>types of estimators and tree/plot factors<br>- sampling units<br>types of sampling units<br>comparison between sampling units<br>sampling units over time and space<br>- simple random sampling and systematic sampling<br>simple random sampling<br>systematic sampling<br>- point sampling<br>point sampling in practice<br>estimators<br>sample size<br>- stratified random sampling<br>definition and interests<br>estimators<br>sample size and allocation of sampling units<br>- single- and multi-stage sampling<br>definition, interests and limitations<br>single stage or cluster sampling<br>two-stage cluster sampling<br>- double sampling<br>principles<br>applications<br><br>2. Additional information<br>This course consists of two modules:<br>- Module 1 (30h): Theoretical course - 14 sessions of 2 hours on the methods of measurement and sampling as well as on the main instruments used for the quantification of trees and forest stands.<br>- Module 2 (22.5 h): The principles studied in theoretical courses are implemented in the form of a mini-project involving the acquisition of field measurements and their computer-aided processing. |
| Bibliography : | - compulsory material (power point slides, transparencies, reference documents) are made available to the student on iCampus;<br>- for more information, students may usefully consult the following references:<br>Rondeux, J. 1999. La mesure des arbres et des peuplements forestiers. Les Presses Agronomiques de Gembloux, Gembloux, Belgique, 521 p.<br>Shiver, B.D., Borders, B.E. 1996. Sampling techniques for forest resource inventory. John Wiley & mp; Sons, New York, USA, 356 p. |
| Faculty or entity in charge: | AGRO |

## Programmes / formations proposant cette unité d'enseignement (UE)

| Intitulé du programme | Sigle | Credits | Prerequis | Acquis d'apprentissage |
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| Master [120] in Forests and Natural Areas Engineering | BIRF2M | 4 | - | |