UCLouvain

lbirf2105

2024

Silviculture and dendrology

6.00 credits	30.0 h + 52.5 h	Q1

Teacher(s)	Ponette Quentin ;
Language :	French > English-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Prerequisite: introductory course in forestry, ecology, plant physiology, systematic botany. Supplementary courses: forest valuation and economics, wood science, forest mensuration, forest management, forest tour
Main themes	1. Main concepts: - context, tags and constraints: time, cost, types of ownerships and owners, stand and ecosystem stability, wood quality; - evenaged monospecific stands: installation, education / stem formation, growth, regeneration; - complex stands: conversion and transformation, selection system, treatment of irregular and / or mixed-species stands; - dendrology: identification and ecology of the main tree species used for silviculture in temperate Europe; - compared applied silvicultures: optimizing silvicultural prescriptions according to the species (biological and ecological characteristics, wood properties), eco-climatic conditions and techno-economic context (e.g. public forests, private forests.).
Learning outcomes	**At the end of this learning unit, the student is able to :** a. Contribution de l'activité au référentiel AA (AA du programme) M1.1, M1.2, M2.1, M2.2, M4.5, M4.6, M4.7, M6.1, M6.2, M6.5, M6.8 b. Formulation spécifique pour cette activité des AA du programme At the end of this activity, the student is able to: 1 - identify the main forest tree species observed in temperate Europe, to determine their taxonomic position and know their ecology; - carry out an ecological and techno-economic stand assessment; on this basis, to establish a detailed and argued silvicultural proposal and write it in the form of an expertise-type report; - establish silvicultural prescriptions for monospecific even-aged stands, with species of contrasting characteristics and in diverse techno-economic contexts; - describe complex stands, understand their dynamics and manage them using current management tools.
Evaluation methods	The presence of the students (participation in at least 80% of the courses; the only absences accepted will be those validated by a medical certificate, a case of "force majeure", or a demonstrated time conflict), participation in practical work and submission of reports are required for this course. In agreement with Article 72 of the General Regulations for Studies and Examinations, the lecturers may propose to the jury to oppose the registration for the examination of a student who has not complied with these obligations. The assessment includes three components: (i) closed-book written exam on classroom lectures; (ii) individual report of the mini-project (integrated stand-site analysis); (iii) oral exam on the identification, systematics and autecology of forest tree species (dendrology). Components (i) and (ii) are assessed in the January session, which will account for 75% of the final grade; the written exam accounts for two-thirds of the grade for the partial exam, and the mini-project for one-third. The remainder of the partial exam covers the dendrology part; it is presented in the June and/or September session(s).
Teaching methods	- lectures including practical examples; - seminars by stakeholders from the socio-professional sphere; - mini-project focused on combined site-stand assessment, and related silvicultural prescriptions; - training to tree marking in a marteloscope; - practical field and laboratory work dedicated to the identification of tree species; - reading and analysis of technical texts/manuals in groups of students; - thematic field excursions on regeneration, as well as on hardwods and conifers silvicultures.
Content	a. Table of contents **Part I - Principles** - silvicultural systems

	- guidelines: socio-economic function; ecological function; multifunctionality; risk management - integrated assessment of sites and stands: principles; forest site quality assessment; stand description and analysis; stand classification **Part II - Silvicultural interventions in evenaged stands** - silvicultural cycle and stages - regeneration stage: objectives and timetable; installation *vs* qualification; adapting to species and environmental conditions; natural *vs* artificial regeneration - thinning stage: modalities; definition of objectives and selection criteria; tools, guidelines and references; practice of thinnings - early stand management: form pruning and artificial pruning - regeneration methods: concepts; modes of action; typology of regeneration methods **Part III - Silviculture of complex stands** - description and assessment : components, stand typology - functioning: basic principles; growth and canopy position; ingrowth and regeneration; stationarity - management and stocking control: the de Liocourt model - advantages and limitations; selection system; control; adapting to species and environmental conditions b. Additional informations This course is organized in the form of five interconnected modules. - Module 1: lectures and seminars - 14 sessions of 2 hours on the establishment, management and transformation of forest stands of contrasting structures and species compositions; - Module 2: excursions - three 1-day field trips devoted to the regeneration of stands, to the silvicultures of hardwoods and to the silvicultures of conifers, respectively; - Module 3: tree marking - initiation to tree marking in irregular stands in a marteloscope; - Module 4: project - integrated site quality - stand assessment, and silvicultural prescriptions; - Module 5: dendrology - five 4-hour sessions and one half-day trip in an arboretum to identify and learn the ecological characteristics of the main species of gymnosperms and angiosperms used for silvicultural purposes in temperate Europe.
Inline resources	Moodle http://www.biologievegetale.be
Bibliography	Les supports de cours obligatoires (diapositives power point, documents de référence) sont mis à disposition de l'étudiant sur Moodle. En outre, le module 5 s'appuie sur un support web interactif consultable à l'adresse : http://www.biologievegetale.be Pour en savoir plus, l'étudiant pourra consulter utilement les ouvrages de référence suivants : - Balleux, P., Van Lerberghe, P. 2006. Guide technique pour des travaux forestiers de qualité. Ministère de la Région Wallonne, DGRNE-DNF, Fiche technique n°17. Namur, Belgique, 373 p. - Bastien, Y., Gauberville, C. (coord.). 2011. Vocabulaire forestier. Ecologie, gestion et conservation des espaces boisés. IDF, Paris, France, 554 p. + annexes - Nyland, R.D. 2002. Silviculture : concepts and applications. 2nd ed. McGraw-Hill, USA, 682 p. - Schütz, J.-P. 1990. Sylviculture 1. Principes d'éducation des forêts. Presses polytechniques et universitaires romandes, Lausanne, Suisse, 243 p. - Schütz, J.-P., 1997. Sylviculture 2. La gestion des forêts irrégulières et mélangées. Presses polytechniques et universitaires romandes, Lausanne, Suisse, 178 p. - Smith, D.M., Larson, B.C., Kelty, M.J., Ashton, P.M.S. 1996.The practice of silviculture: applied forest ecology. 9th ed. John Wiley & Sons, New York, USA
Other infos	This course can be given in English. This course presents the tools for diagnosing forest sites and stands, and explains in detail the diversity of treatments and stand management methods. It thus contributes to optimizing silvicultural interventions by taking into account the management objectives, the autecology of tree species and the site characteristics. This course is committed to transition and sustainable development. The evaluation of the “dendrology” part takes place in the second semester.
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	6		