UCLouvain

lbirf2104

2018

5 credits	37.5 h + 22.5 h	Q2

Teacher(s)	Jacquemart Anne-Laure ;Ponette Quentin coordinator ;Vincke Caroline ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	- techniques of vegetation analysis: concepts and principles of plant sociology, methods of vegetation surveys and multivariate analyses of vegetation releves, influence of agro-forestry-pastoral ancestral practices on current vegetation; - determinants of plant assemblages and vegetation dynamics, vegetation mapping; - phytogeography, plant ecology and indicator value of species; - plant demography, reproduction, dispersal; - productivity and fluxes in forest ecosystems: energy, light, water, nutrients, carbon; - site assessment: risks, constraints and potentialities; - stability of forest ecosystems (case study): understanding of the issues, design of integrated protection strategies.
Aims	Learning Outcomes M1.1, M1.2, M1.3, M1.4, M1.5, M2.1, M2.2, M2.3, M2.4, M2.5, M3.2;, M3.4, M3.5, M3.7, M3.8, M4.1, M4.2, M4.3, M4.7, M6.2, M6.4, M6.5, M6.6, M6.7, M6.8, M7.1. At the end of this activity, the student is able to: - identify the different plant species, realize vegetation surveys (Braun-Blanquet method or transect) and determine the forest type and origin in relation with soil and biogeography constraints; - analyse vegetation surveys with adequate statistics, realize a synthetic table, defend and argument its choices and vegetation types; - integrate vegetation type and history, sylvo-agro practices, biogeography and climate to propose habitat management; - understand the basics of site assessment; - use the range of tools available for site characterization (e.g. phytosociology, afforestation guides, ...) for proper management; - understand the regulation of flows (energy, light, water, nutrients, carbon) in forest ecosystems by integrating theoretical and practical examples presented in this course, in order to derive (i) the impact of forests on the environment and (ii) appropriate management options; - consider abiotic risks in forest management by controlling the underlying processes and integrating the concepts of forest multifunctionality, in order to minimize the impacts of these hazards on forests ecosystems with a long-term vision. 1 - - - - *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	Evaluation: - Part A: Preparation and oral presentation of a phytosociological table, oral exam focused on problem solving, synthetic analysis of a problem; - Part B: writing exam (short answers or answers based on a theoretical development)
Teaching methods	Teaching team: Teachers and technician for lectures, for field excursions and labs. Teaching methods: - lectures including practical examples and active learning mini activities; - seminars given by guest speakers (speakers from the socio-professional or scientific spheres); - field excursions including practical learning of vegetation survey, determination of the flora and of the type of vegetation; - multidisciplinary mini project; - supervised statistical analysis of the vegetation surveys in the computer room; - individual reading of a scientific paper and critical analysis in groups. Miscellaneous : Modules 1 and 2 (15h + 22.5h) constitute a mandatory 4-credit course entitled 'Forest ecology and phytosociology, partim phytosociology' for students of option S5E (Land development) within the master in environmental bioengineering and students within the master in biology (BOE).
Content	A. Table of contents

	1. Site assessment - specificities of site assessment in forest ecosystems - objectives of the assessment - typology of current tools and approaches - indicators of fertility - examples of decision-support tools 2. Flow control in forest ecosystems - light and energy - water - carbon - nutrients 3. Risk management in forests: windstorms as an example 4. Phytosociology - phytogeography and vegetation history at the global and local scales - physiognomic approach to vegetation - phytosociological approach and techniques of analysis, including multivariate statistical analyses - vegetation dynamics; intrinsic and extrinsic influences, including traditional agro-forestry-pastoral practices; progressive and regressive series - vegetation mapping - field surveys (4 one-day excursions) and determination of forest types. B. Additional informations This course includes two modules that can be combined to form two partims: - Module 1 (15h-22.5h): fundamentals of vegetation analysis and phytosociology - 7 2-hour sessions (theoretical courses and seminars on more applied themes); practical exercises in phytosociology - 4 one-day excursions (a last one is shared with the course 'Applied soil sciences' - BIRE2104), a lab (2 hours) devoted to statistical analysis of vegetation samples; - Module 2 (22h): site assessment, biogeochemistry of forested ecosystems, tree ecophysiology - 11 2-hour sessions. Part A (module 1) - Phytosociology ' is mandatory for students from the following masters: BIRF (all options), BIRE (5E option) and BOE (environmental management option); Part B (module 2) - Site assessment and biogeochemical cycles - is a required course for the master BIRF; it can be taken as electives by students from masters BIRA, BIRE and BOE.
Inline resources	Moodle
Bibliography	- les supports de cours obligatoires (diapositives power point, syllabus, liste des espèces rencontrées lors des sorties de terrain, documents de référence) sont mis à disposition de l'étudiants sur Moodle ; Le programme utilisé pour les analyses statistiques (PC-ORD) est disponible en salle informatique. - pour en savoir plus, l'étudiant pourra consulter utilement les ouvrages de référence suivants : Barnes, B.V., Zak, D.R., Denton, S.R., Spurr, S.H. 1998. Forest ecology. 4th ed. John Wiley & Sons, New York, USA, 774 p. Chapin III, F.S., Matson, P.A., Mooney, H.A. 2002. Principles of terrestrial ecosystem ecology. Springer, New York, USA, 436 p. Jabiol, B., Lévy, G., Bonneau, M., Brêthes, A. 2009. Comprendre les sols pour mieux gérer les forêts. Contraintes et fragilités des sols, choix des essences, précautions sylvicoles, améliorations. AgroParis Tech ENGREF, Nancy, France, 624 p. Kimmins, J.P. 2004. Forest ecology. A foundation for sustainable forest management and environmental ethics in forestry. 3rd edition. Prentice Hall, Upper Saddle River, USA, 611 p. + annexes Larcher, W. 2003. Physiological plant ecology. Ecophysiology and stress physiology of functional groups. 4th ed. Springer, Berlin, 513 p.
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	Aims
Master [120] in Forests and Natural Areas Engineering	BIRF2M	5		