Code: 1658 **Forest Biology**
Degree: 1st cycle - Forestry and Natural Resources
Curricular Year: 2nd **Semester Course: 1st**
Credits: 6 ECTS **Compulsory**
Language: Portuguese/English
Responsible: João Manuel Dias dos Santos Pereira
Other lecturer(s): Maria de Fátima Cerveira Tavares, Maria Helena Reis de Noronha Ribeiro de Almeida and Ricardo Manuel Seixas Boavida Ferreira
Web Site: http://www.isa.utl.pt/home/node/4000

1. Contact hours:
Lectures 28 **Lecture/Praticals** 22 **Praticals/Laboratory** 20 **Others** 14 **Total** 84

2. Objectives:

The student must acquire the concepts of biology (framed by the pertinent knowledge of physics, chemistry and mathematics) to interpret the responses of trees to variations in the wild or under the environmental conditions that result from technical intervention in forestry or in the urban environment and decide on biological grounds on the appropriateness of models of forestry and forest management, in the context of global change.

3. Programme:

Introduction: why are there trees – general perception of the nature of trees:form, function, and time.

Development and growth of trees: development: environmental factors and plant signaling. Stem elongation and crown architecture. Growth and structure: Thickening of the stems and roots (secondary). Characteristics of wood. The bark. Dendrochronology. Roots and architecture of roots.

The functioning of the trees: absorption and transport of water. The functionality of xylem; Some notions of biomechanics. The reproductive process and seed physiology.

Productivity: Photosynthesis and respiration; translocation of assimilated and accumulating reserves. The carbon balance in forests; Modeling; Secondary metabolism products – defense and VOC compounds .

Ecophysiology (some notions) – (1) Physiological stress; abiotic factors, temperature and light; water, nature and soil condition. (2) adaptation of vegetation to climate, soil and geology. (3) trees in urban areas. (4) responses to global change.

Genetics of populations: Analyse of factors and causes that conditioning genetic variation (within and between populations) . Selection in Small Populations. Genetic Variation and Adaptation

4. Bibliography:

Main Bibliography

Pereira, João Santos e Correia, Alexandre V. 2005. ***Conhecer as florestas*,** Instituto Superior de Agronomia, Lisboa, Portugal.
http://www.portalflorestal.com/canais/article.asp?id=1074&lang=1
Ennos, R. 2001. ***Trees.*** The Smithsonian Institution Press, Washington DC (in association with the Natural History Museum, London).
Taiz, Lincoln & Zeiger, Eduardo 2006. ***Plant Physiology***. Sinauer Associates, Inc.
http://www.plantphys.net
Larcher, W. 2000. ***Ecofisiologia Vegetal***. RIMA Artes e Textos, São Carlos, SP.Brasil.
Morey, P.R. 1980. ***O Crescimento das Árvores***. Ed. Pedagógica e Universitária. (Coleção Temas de Biologia). São Paulo (BISA: **F05-32, 33**)

Other Bibliography

Schulze, E.D., E. Beck and K. Müller-Hohenstein 2005. ***Plant Ecology***. Springer-Verlag, Berlin, Heidelberg. IX, 702 pp.
Azcón Bieto, Joaquim & Talón, Manuel 2000. **Fundamentos de fisiología vegetal.** McGraw-Hill Interamericana
Eriksson, G., Ekberg,I., Clapham D. 2006. An introduction to forest genetics, 2ª ed.Genetic Center, Dept. Plant Biology and Forest Genetics, SLU, Uppsala Sweden - ISBN 91-576-7190-7

5. Assessment:

The assessment is based on continuous assessment and the final exam covering the entire course.
Attendance and admission to the final examination – participation in 75% of lectures.
Continuous assessment consists of
A mid-term test (at the end of the 4th chapter). The classification of 12 (out of 20) grants exemption from part of the final examination, i.e. the matters covered in the mid-term test.
Research: the students are required to present a written essay on topics assigned to them by the course coordinator. The classification of this work will contribute 15% for the final mark. (Students admitted to exam in previous years, may choose not to do the research work).

6. Estimated Workload:	168	Hours
7. Last Update:	13/7/2010	