

**Code: 1745 Plant Protection**Degree: 1<sup>st</sup> cycle - AgricultureCurricular Year: 2<sup>nd</sup>

Credits: 6 ECTS

Language: Portuguese/English

Prerequisites: Botany and Zoology

Responsible: Arlindo Lima

**Other lecturer(s):** Ana Maria da Silva Monteiro, Ana Paula Ferreira Ramos, António Maria Marques Mexia, Elisabete Tavares Lacerda de Figueiredo Oliveira, José Carlos Franco Santos Silva and Maria José Antão Pais de Almeida Cerejeira

Web Site: <http://www.isa.utl.pt/home/node/3992>Semester Course: 1<sup>st</sup>

Compulsory

**1. Contact hours:**

Lectures 28 Practicals/Laboratory 42 Others 14 Total 84

**2. Objectives:**

Provide students with concepts that form the basis for understanding the causes of plant injury; provide students with experience in identification of symptoms and signs and diagnoses of specific causal agents; provide students in understanding the concepts and nomenclature of weed science, in understanding the basis for the many pest management strategies and tactics that provide crops protection from pests; and provide them with an appreciation for the hazards, environmental concerns, and governmental regulations which are associated with the use of pesticides

**3. Programme:**

**Introduction to plant protection:** domain and objectives; fundamental concepts: symptoms, injury, competition, economic damage; injury agents; pest status; the integrated pest management (IPM) concept and its components; decision making in IPM

**Principles and Concepts in Plant Pathology:** disease and causal agent of disease; parasitism and pathogenicity; plant-pathogen interactions; host range; disease triangle; disease cycle/infection cycle, relationship between disease cycle and epidemic epidemiology; causative agents of plant diseases: pseudofungi and fungi; bacteria; phytoplasma; viruses and subviral particles; nematodes

**Principles and Concepts in Entomology:** pest status, types of injury; life history; temperature and development; trophic interactions; host relationship: specialists *versus* generalists; pest population dynamics: the concept of outbreak; pest resurgence and secondary pests; population regulation; major groups of pests: insects, mites and other groups

**Weed Science Principles:** What is a Weed and invasive species?; introduction to weed population dynamics; weed interference: competition and allelopathy; critical period of competition; interaction between weed biology and management under conventional, sustainable, biological and conservation agriculture principles. Identification in the vegetative stage of main weed families

**Phytofarmacology principles :** basic concepts in pesticide science; pesticide definition; classification of pesticides; formulation types; fundamental aspects on application methods; importance and main components of plant protection product label; risk symbols, risk and security phrases

**Strategies and Tactics of Pest Management:** Strategies and tactics in plant protection; management tactics; integration of management tactics

**4. Bibliography:****Main Bibliography**

PowerPoint lectures distributed in class

Agrios, G. N. (2005) *Plant pathology*. 5<sup>th</sup> ed., Academic Press, Inc., San DiegoAmaro, P.(2003) *A Protecção Integrada*. ISA/Press, LisboaCarvalho, J. Passos de (1986) *Introdução à entomologia agrícola*. F.C. Gulbenkian, Lisboa.Wilson F. M (2003) *Optimising pesticide use*. John Wiley & Sons.Radosevich, S.; Holt, J. & Ghera, C. (1997) *Weed Ecology. Implications for management*. 2<sup>a</sup> Edition. John Wiley & Sons, Inc. New York**Other Bibliography**Maurin, G. (1999) *Guide pratique de défense des cultures*. Édition le Carrousel et ACTA, ParisMoreira, I. & Monteiro, A. (2000) *Cadernos de Herbologia 1. Conceitos Gerais*. Instituto Superior de Agronomia. AEISARagsdale, N. N. & Seiber, J.N. (1999) – *Pesticides: managing risks and optimizing benefits*. ACS Symposium Series, 734. American Chemical Society, Washington, DCGullan, P.J. & Cranston, P.S. (1994). *The insects. An outline of Entomology*. Chapman & Hall, LondonRadcliffe EB & Hutchison WD (eds) (2003) *Radcliffe's IPM World Textbook*, University of Minnesota, St. Paul, MN**5. Assessment:**

I. Lab attendance: 80 % of the theoretical-practical classes

II. Method of Evaluation and Grading:

A) Continuous Evaluation

1. Midterm Exams (70%)

2. Reports and Problem Sets (30%)

B) Final Exam (70%) + Reports and Problem Sets (30%)

C) Final Exam (70%) + Practical Exam (30%)

III. Grading: The lowest passing grade is 50%, using a 0-20 scale

6. Estimated Workload:

168 Hours

7. Last Update:

9/3/2011