Code: 1725 **Plant Nutrition, Soil Fertility and Fertilization**
Degree: 1st cycle - Agriculture
Curricular Year: 2nd **Semester Course: 2nd**
Credits: 6 ECTS **Compulsory**
Language: Portuguese/English
Responsible: Ernesto José de Melo Pestana de Vasconcelos
Other lecturer(s): Fernanda Maria Miranda Cabral e Amarilis Paula Alberti de Varennes e Mendonça
Web Site: http://www.isa.utl.pt/home/node/3996

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

2. Objectives:

Basic principles of plant nutrition for crop production, soil fertility maintenance, fertilizer materials, crop fertilization, and practices for optimizing fertilizer use

3. Programme:

Lectures
Mineral nutrition of higher plants: Plant nutrients: Definition and classification. Nutrients supply to the roots. Uptake of plant Nutrient. Transport in the xylem. Transport in the phloem. Nutrients turnover. Principal functions, deficiency and toxicity of essential elements. Nutrients Levels f in plants. Nutrients and crop production. Growth factors. Laws of growth
Soil fertility. Nutrients in the soil. Movement of nutrients in the soil
Behavior of macronutrient and micronutrient elements in the soil. Cycles of nitrogen and phosphorus
Fertilizers: Classification. Elemental fertilizers: nitrogen, phosphate and potassium. Fertilizer mixtures. NPK fertilizers. Mineral and organic amendments Soil conditioners Recommendations of fertilization, based on soil and plant analysis.
Lectures/ praticals
Introduction to Soil Fertility. Methodologies for soil sample Analysis. Methodologies for plant sample Analysis.
Preliminary Fertilizer Analysis
Basic recommendation for Fertilization plans.

4. Bibliography:

Main Bibliography

Brady, N. C. & Weil, R.R. 1999. The Nature and Properties of Soil (12th edition). New Jersey, Prentice Hall.
Hillel, Daniel. 2004. Introduction to Environmental Soil Physics. Elsevier Academic Press, Amsterdam.
Marschner H 1995 Mineral Nutrition of plants.Academic Press London
Mengel K Kirby EA 2001 Principles of Plant Nutrition.Kluwer Acad. Publ.
Varennes A 2003 Produtividade dos Solos e Ambiente. Escolar Editora, Lisboa
White, R.E. 1997. Principles and Practice of Soil Science, (3rd edition). Oxford, Blackwell Science

Other Bibliography

Bacon PE 1995 Nitrogem fertilization in the environment. Marcel Dekker Inc.
Botelho da Costa, J. V. 1975. Caracterização e Constituição do Solo. Lisboa, Fundação Calouste Gulbenkian
Santos, JQ 2002 – Fertilização. Fundamentos da utilização de adubos e correctivos. Ed. Castro, F.L. Pub. Europa-América, Mem Martins
Tan KH 1998 Principles of Soil Chemistry, Marcel Dekker Inc

5. Assessment:

The evaluation is done by performing two tests in which the students must have an average of 10 points, 9 the minimum score in each of the tests
By carrying out a final exam involving all matter theory and theoretical practice in which the student must obtain a minimum score of 10 points

6. Estimated Workload: 168 Hours
7. Last Update: 8/7/2010