

Course Unit	Plant Ecophysiology		Field of study	Agricultural and animal production	
HPTC in	Agricultural Production		School	School of Agriculture	
Academic Year	2023/2024	Year of study	1	Level	0-1
Type	Semestral	Semester	2	ECTS credits	5.5
Code	4069-577-1002-00-23				
Workload (hours)	148,5	Contact hours	T	-	TP
			PL	-	TC
			S	-	E
			OT	60	O

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Ana Maria Antão Gerales

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
Be acquainted with biochemical and physical processes occurring in plants. Understand water, nutritional and energy relations, as well as the development and vegetal growth.

Prerequisites

Before the course unit the learner is expected to be able to:
Some general knowledge of Biology.

Course contents

1. Water relations 2. Transpiration 3. Nutrition 4. Photosynthesis 5. Photorespiration 6. Plant Growth and development 7. Plant Ecophysiology

Course contents (extended version)

1. Water in plants. Main biological functions. Diffusion, mass flow and osmosis.
2. Water potential. Soil-plant-atmosphere system. Water absorption by the plant. Water in xylem.
3. Transpiration. Stomata physiology. Environmental /physiological control of stomata functioning.
4. Physiological/ environmental factors influencing transpiration. Photosynthesis/transpiration ratio
5. Nutrition. Essential mineral elements. Macronutrients and micronutrients. Functions and deficiency.
6. Transport in phloem: structure and transport mechanisms.
7. Photosynthesis. Structure of Photosynthetic system. Regulation of Photosynthetic Process.
8. Plants C3, C4, CAM. RubisCO: Structure and regulation. Photorespiration.
9. Factors affecting photosynthesis : Light, Temperature, CO2 and water availability
10. Shade/Sun plants. Responses of C3, C4 and CAM plants to light, temperature CO2 and to water amounts
11. Plant Growth and development.
12. Phytohormones: Physiological role. How environment influences phytohormones action.
13. Biological and physiological functions of the plant phytochrome
14. Plant Secondary metabolites: characteristics and functions
15. Physiological stress. Structural and functional mechanisms of plant response to stressors.

Recommended reading

1. TAIZ, L; MURPHY, A. MOLLER IM E ZEIGER E (2021) Fundamentos de Fisiologia Vegetal Artmed Editora
2. KELLER, M (2015) The science of grapevines : anatomy and physiology. Elsevier/Academic Press.
3. RAVEN PH, EVERT RFC & EICHHORN SE (2012). Biology of Plants. 8th ed. , W. H. Freeman and Company. New York
4. JAIN, V K (2022) Fundamentals Of Plant Physiology (20th Edition) S. CHAND PUBLISHING

Teaching and learning methods

Theoretical lectures with expositive methods, utilization of audio-visual resources. Laboratorial practical exercises.

Assessment methods

1. alternativa 2 - (Regular, Student Worker) (Final)
 - Intermediate Written Test - 50%
 - Final Written Exam - 50%
2. Alternative 2 - (Regular, Student Worker) (Final)
 - Final Written Exam - 100%
3. Alternative 3 - (Regular, Student Worker) (Supplementary, Special)
 - Final Written Exam - 100%

Language of instruction

Portuguese

Electronic validation

Ana Maria Antão Gerales	Maria João Almeida Coelho Sousa	Luís Manuel Cunha Santos	Paula Cristina Azevedo Rodrigues
21-01-2024	22-01-2024	22-01-2024	22-01-2024