



MODELLO SCHEDA INSEGNAMENTO

Corso di L/LM/LMC	Scienze Biologiche triennale
Denominazione insegnamento:	Fisiologia Vegetale
Numero di Crediti:	9
Semestre:	1
Docente Titolare:	Rocco Mariapina
Dottorandi/assegnisti di ricerca che svolgono attività didattica a supporto del corso:	
Orario di ricevimento:	Martedì dalle 14.00 alle 16.00, Giovedì dalle 14.00 alle 16.00
Indirizzo:	via Port'Arso 11 Benevento

COURSE PRESENTATION :

The course provides basic knowledge of plant physiology, processes and functions carried out by plants with particular reference to the use of water, light and carbon; growth and development, plant hormones, biotic and abiotic stresses.

THE FORMATIVE OBJECTIVES

The aim of the course is to provide the basic foundations of plant physiology to students, starting from the study of water as the ideal nutrient solvent to reach fundamental themes such as photosynthesis and regulation, hormonal plants, nitrogen fixation, plant responses to light and responses to biotic and abiotic stress. The students must understand and be able to discuss the properties of water and its role in plant life; acquire knowledge on the interaction between light, water and carbon dioxide; learn the biochemical and biophysical mechanism of photosynthesis in light and carbon reactions; know how to differentiate the various photosynthetic categories (C3, C4, CAM) in relation to leaf function and morphology; know the biosynthetic route, transport and physiological functions of the major vegetable hormones. In addition, students will learn how plants, sessile organisms unable to get away from injury or predators, are able to respond and endure a variety of biotic and abiotic stresses.

REQUIRED PRACTICES

To deal with the course of Plant Physiology, it is preferable to acquire knowledge gained in the courses of General and Inorganic Chemistry, Organic Chemistry, Biochemistry, Molecular Biology and Botany.

FREQUENCY OF LESSONS

Frequency is recommended for a better and simpler understanding of the topics discussed during frontal lessons and to be able to use didactic didactics.

CONTENTS OF THE COURSE

The Plant Cell. The cell wall: structure, modification and growth
Transport of water and solutes. Water absorption and movement. The water potential. Xylematic transport. Ion absorption. Active and Passive Transport. Moving nutrients. Floating transport. Photosynthesis, photosynthetic carbon organization. Energy efficiency of photosynthesis. Photorespiration of C4 plants and CAM plants. Starch and sucrose biosynthesis. Nitrogen metabolism. Growth development and regulation: the hormone system of plants. Phytochromes of photomorphogenesis
Abiotic and biotic stresses: how plants are able to adapt to stress and defense mechanisms

DIDACTIC METHODS

The course includes frontal lessons and laboratory exercises.

REFERENCE TEXTS

Taiz L. and Zeiger E. "Plant Physiology" Piccin, Padua. -three edition- Alps A., Pupillo P., Rigano C., "Plant Physiology", Società Editrice Scientifica, Naples.

Maffei M. "Biochemical Plant" Piccin, Padua.

Buchanan, Gruissem, Jones "Biology and Molecular Plants Biology" American Society of Physiology Plant.

PROFIT EXAMINATION

The purpose of the exam is to check the level of knowledge and depth of the subject's course program and the reasoning skills developed by the student. The exam consists of a written work composed of 30 multiple questions equally distributed for the various subjects of the course. For each question the score obtained is 1 point in case of exact and complete answer or 0 points in case of incorrect answer. Optional oral exam usually consists of 3 or 4 questions (one on photosynthetic metabolism, one on mineral nutrition, one on the hormones, one on one of the remaining topics discussed in the course, particularly on abiotic or biotic stresses). It is not considered to have passed the exam if the student

fails to argue substantially on any of the questions asked, or if the course is limited to exhibiting only one statement without demonstrating a proper understanding of the same.

EXAM CALENDAR

<http://www.dstunisannio.it/index.php/studenti/appelli-esami>

EXAMS RESERVATION

<https://servizistudenti.unisannio.it/pls/self/gissweb.home>

SYLLABUS

Topics	hours	Bibliographic references	Type of lesson
Plant cell	7	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and Molecular Biology.	Frontal lesson with power point presentation
cell wall	4	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and Molecular Biology.	Frontal lesson with power point presentation
Water	8	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and Molecular Biology.	Frontal lesson with power point presentation
Floema and Xilema	4	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and Molecular Biology.	Frontal lesson with power point presentation
Photosynthesis	16	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and Molecular Biology.	Frontal lesson with power point presentation
Starch biosynthesis and sucrose	4	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and	Frontal lesson with power point

		Molecular Biology.	presentation
Nitrogen metabolism	3	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and Molecular Biology.	Frontal lesson with power point presentation
Vegetable Hormones	20	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and Molecular Biology.	Frontal lesson with power point presentation
Phytochrome	2	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and Molecular Biology.	Frontal lesson with power point presentation
Abiotic and biotic stresses	10	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and Molecular Biology.	Frontal lesson with power point presentation
Trangenic plants	3	Taiz ,Biochimica Vegetale; Buchanan, Biochemistry and Molecular Biology.	Frontal lesson with power point presentation