



**UNIVERSIDAD  
FRANCISCO DE VITORIA**  
**VINCE IN BONO MALUM**

Teachers' guide – summary sheet

**Initial Identification details:**

Title:	Degree in Biotechnology (Plan 2009)
Faculty/School:	Bio-Health Sciences
Course subject:	<b>Animal and Plant Physiology</b>
Type (3):	Basic Teaching
	Credits ECTS: 6
Year / Semester (4):	2nd Year-4th Semester
	Code (1): 2026
Subject (2):	Physiology
Module (2):	Biochemistry and Molecular Biology
Language (5):	Spanish
Total number of hours undertaken by pupil (6):	150

**Brief description of the course (7):**

This course is intended for students familiar with the operation of different systems of animal and plant organisms and how each contributes to the functions for organism. You should understand the principles and foundations of the physiological responses of animals and plants into the environment and to assess the impact of alterations of these responses, the mechanism of action of these changes and its basic expression.

**Prior knowledge (8):**

Knowledge of physics, chemistry and cell biology, all perfectly achievable with other subjects that are previously taught in this degree.

**General objective (9):**

Get a basic understanding of the functions of the organs in the human body compared to other animals as well as the regulation for the maintenance of homeostasis in body. Knowing the physiology of plants, understanding the biological mechanisms by which the plant grows in the environment in which they live. Understanding those aspects that may be of greater use in biotechnology

**Skills / Abilities:**

## General (10):

Acquire a solid technological and humanistic training necessary for the development of the profession.  
Develop the ability to search, assimilation, analysis, synthesis and reporting relationship.  
Develop skills of oral and written communication.  
Acquire the skills required for experimental work: implementation, collection of results and drawing conclusions, understanding the limitations of the experimental approach.  
Acquiring the ability to think analytically, synthetically, reflectively, critically, theoretical and practically.  
Develop the capacity and commitment for own learning and personal development.

## Specific (10):

The anatomy and physical, chemical and molecular bases that occur in the systems of animals and plants.  
Understanding the principles and fundamentals of the physiological responses of animals and plants into the environment.  
Work properly in a laboratory with biological material (bacteria, fungi, viruses, animal and plant cells, plants and animals) including security, handling and disposal of biological waste.  
Know how to design and implement adequately an experimental protocol from the knowledge of different subjects  
Identify and define instruments and laboratory materials.

## Brief index to subjects (12):

**Module 1: ANIMAL PHYSIOLOGY**

Introduction. Concept of Physiology. History. Homeostasis. Organization of the internal environment.

Item 1. Nervous System

Item 2. Physiology of the senses

Item 3. Muscle. Mechanism of contraction and neural control

Item 4. Endocrine system

Item 5. Circulatory system

Item 6. Respiratory system

Item 7. Digestive System

Item 8. Renal physiology and osmo-regulation

Item 9. Reproductive System

**Module 2: PLANT PHYSIOLOGY**

Item 1. Plant cells and water: Water relations. Availability, absorption and transport water. Diffusion and Flow. Water potential. Perspiration

Item 2. Mineral nutrition: Essential nutrients and availability. Mechanisms of absorption and solute transport

Item 3. Photosynthesis, light-dependent reactions. Carbon metabolism. Physiology and organic. Environmental factors affecting photosynthesis

Item 4. Respiration: Glycolysis and Krebs cycle

Item 5. Assimilation of mineral nutrients: nitrogen, sulfur and phosphate. Symbiotic N<sub>2</sub> fixation. Mycorrhizae

Item 6. Secondary metabolism

Item 7. Life cycle of seed plants: Components of development. Seeds: germination, dormancy and vernalization. Root development and stem. Flowering

- Item 8. Exogenous factors affecting development: photo-morphogenesis. Phyto-chromes and crypto-chromes  
 Item 9. Phyto-hormones: composition and function. Auxins, gibberellins, cytokinins, abscisic acid and ethylene  
 Item 10. In vitro cultures and their applications

**Teaching Activities (13)** (Approximate % as a function of total credits, considering solely those activities where the student's presence is required and that these represent between 30% and 40%)

Theory classes:	60%
Practical Classes:	30%
Workshops/Labs/Presentations:	10%
Others:	0%
Total:	100%

**Evaluation system:**

Examinations:	65%
Assistance and participation:	5%
Course work:	20%
Others:	10%
Total:	100%

**Specifics of evaluation (14):**

Theory tests 65%

Written tests will be done to assess the learning of content presented in the lectures, practice, work and discussions. Must pass the final exam to pass the course.

Preparation and presentation of work 20%

Will assess the implementation and oral and written presentation of work carried out and supervised by the teacher.

Participation in the development of classes, blog and discussion 5%

Active participation during lectures and intervention in the debates on specific issues arising in classroom and on the blog.

Performing laboratory work 10%

**Basic bibliography (15):**

Guyton and Hall (2006). *Tratado de Fisiología Médica*. 11º ed. Elsevier.

Fox (2008). *Fisiología Humana*. 10º ed. McGraw-Hill, Madrid.

Pocock y Richards (2005). *Fisiología Humana: La base de la medicina*. 2º ed. Elsevier-Masson.

Taiz, L., Zeiger, E. (2006). *Plant Physiology*. 4th ed. Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts.

Buchanan, BB., Grussem, W., Jones, RL. (2000). *Biochemistry and Molecular Biology of the Plants*. American Society of Plant Physiologists, Rockville, Maryland.

- (1) Code of the course
- (2) Description as per the Verified Memorandum
- (3) May be either: Basic Teaching, Obligatory, Optional, External Practices, or Final Degree Work.
- (4) May be either: First Year - 1st semester and (or) 2nd semester; Second Year - 3rd semester and (or) 4th semester; Third Year - 5th semester and (or) 6th semester; Fourth Year – 7th semester and (or) 8th semester.
- (5) The language in which the course will be taught
- (6) The total number of hours that the student will dedicate to the course. Being approximately twenty-five hours for each ECTS, accounting for all activities.
- (7) Between three and five phrases that summarize the description of the course.
- (8) Corresponds to those recommendations to aid taking the course. A brief recommendation is written. If they are not required, one specifies "those corresponding to the degree".
- (9) Set out the general objective of the course, writing a sole objective.
- (10) The skills as set out in the Verified Memorandum along with the abbreviations corresponding to each of them

- (11) One can add various other skills that are not in the Verified Memorandum and which the teacher deems relevant
- (12) The main thematic blocks of the course
- (13) In this case neither tutorials nor evaluations are included. Only those activities where the student is present.
- (14) Explain the process of evaluation that has been set out previously in percentages with three brief phrases
- (15) Three to ten references should be detailed.

