1. BASIC INFORMATION

Subject	Animal and Plant Physiology
Degree	Bachelor Degree in Biotechnology
School/ Faculty	Faculty of Biomedical and Health Sciences
Year	Second
ECTS	9 ECTS
Type	Core
Languages	English
Mode	On-site learning
Semester	First and second
Academic year	25-26
Coordinating teacher	Maria Jesus Sanz
Teachers	Beatriz Moreno, Alejandra Quiroga and Maria Jesus Sanz

2. PRESENTATION

The syllabus of this subject intends provide to the student the necessary knowledge in the in the field of animal and plant physiology, which will be very useful in their training as biotechnologists. The topic is structured in various sections aimed at deepening their knowledge of animal and plant physiology.

Studying this subject will allow students to acquire fundamental knowledge regarding the functioning of the human body through the study of the functions of the organs and systems that make up the human body.

Gaining an understanding of the contents developed within this subject will provide the basis for the comprehension and study of others subjects integrated in the degree's study programme.

3. LEARNING OUTCOMES

Knowledge

CON02. Recognizing the structure, organization and function of the viral and cellular entities, tissues, organs and systems, as well as the processes in which they are involved.

- Knowing the basic concept basics regarding physiology such as homeostasis.
- Recognizing the morphology and function of the different types of tissues, organs and systems that make up the human body.
- Grasping the composition and function of the blood and its role in homeostasis.
- Knowing the principles of cellular excitability as well as the transmission of the neural impulse and muscle contraction.
- Understanding the structure and function of the regulatory and integrating systems within the human body: the nervous system and endocrine system.

• Recognizing the structure and function of systems such as: respiratory system, cardiovascular system, urinary system or digestive system. Learning the main plant system's functions in plants as well as the mechanisms regulating them.
• Knowing the biochemical processes that support plat metabolism.

Competencies
COMP02. Identify and describe the structure and function of the different types of cells, in both in unicellular and multicellular organisms.

4. CONTENTS

Subject topics will be distributed as follows:

BLOCK I: CELLULAR PHYSIOLOGY
• Topic 1: INTRODUCTION TO PHYSIOLOGY: Homeostasis and regulation. Body fluids.
• Topic 2.- MEMBRANE DYNAMICS: Transport. Membrane potential.
• Topic 3.- INTERCELLULAR COMMUNICATION: Signalling pathways.
• Topic 4.- THE BLOOD. Composition and function. Homeostasis.
• Topic 5.- INTRODUCTION TO THE NERVOUS SYSTEM.
• Topic 6.- NEUROPHYSIOLOGY I: Neural impulse transmission.
• Topic 7.- NEUROPHYSIOLOGY II: The synapse. Sensory physiology. Autonomous Nervous System.
• Topic 8.- MUSCLE TISSUE I. Description of the muscle tissue. Skeletal muscle contraction.
• Topic 9.- MUSCLE TISSUE II. Motion mechanics. Smooth muscle.

BLOCK II: SYSTEMS PHYSIOLOGY
• Topic 10.- ENDOCRINE SYSTEM I.
• Topic 11.- ENDOCRINE SYSTEM II.
• Topic 12.- ENDOCRINE SYSTEM III.
• Topic 13.- RESPIRATORY SYSTEM.
• Topic 14.- CARDIOVASCULAR SYSTEM.
• Topic 15.- DIGESTIVE SYSTEM.
• Topic 16.- EXCRETORY SYSTEM.

BLOCK III: PLANT PHYSIOLOGY
• Topic 17.- PLANT STRUCTURE.
• Topic 18.- PLANT NUTRITION. Absorption and transport.
• Topic 19.- PLANT HORMONES.
• Topic 20.- PHOTOSYNTHESIS.

5. METHODOLOGIES OF TEACHING-LEARNING

The following are the types of teaching-learning methodologies that will be applied:

- Lectures
- Cooperative learning
- Learning based on workshop-/laboratory-based learning

6. TRAINING ACTIVITIES

The types of training activities that will be carried out and the hours of student's dedication to each of them are as follows:

On-site learning:

Activity	Number of hours
Lectures	47
Asynchronous lessons	15
Debates and discussions	2
Case analysis	20
Problems/exercises	12
Student's oral presentations	4
Reports and essays	15
Tutoring	20
Autonomous work	70
Activities in workshops and/or laboratories	10
On-site objective knowledge tests	10
TOTAL	**225**

7. ASSESSMENT

The evaluation systems are listed below, as well as their weight in the total grade for the subject:

On-site mode:

Evaluation system	Weight
On-site knowledge tests	60%
Student's oral presentations	5%
Reports and essays	15%
Cases/problems	5%
Activities in laboratories	15%

On the Virtual Campus, when you access the subject, you will be able to consult in detail the assessment activities that must be carried out, as well as the delivery dates and the assessment procedures for each of them.

7.1. Ordinary call (ordinary exam period)

To pass the subject in the ordinary exam period, students must obtain a mark of al least 5.0 out of 10.0 points in all parts of the evaluation of the subject. Those sections that are marked under 5.00 points (not passed) in the ordinary call must be re-assessed in the extraordinary session.

The final grade will be the weighted average of the partial grades of each of the approved training activities, according to the table above.

The continuous assessment system for training activities requires attendance of at least 50% of classes.

It is mandatory to justify at least 50% attendance at classes, as a necessary part of the assessment process and to comply with the student's right to receive advice, assistance and academic monitoring from the professor. For these purposes, students must use the technological system that the University makes available to them, to prove their daily attendance at each of their classes. This system will also serve to guarantee objective information on the student's active role in the classroom. Failure to prove by the means proposed by the university, of at least 50% attendance, will authorize the professor to grade the subject as failed in the ordinary call, in accordance with the grading system provided for in these regulations. All of this, without prejudice to other requirements or higher attendance percentages that each faculty may establish in the teaching guides or in its internal regulations. Regulations for the assessment of official degree qualifications, Art. 1 point 4.

(http://www.uem.es/myfiles/pageposts/reglamento_evaluacion_titulaciones_oficiales_grado.pdf).

7.2. Extraordinary call (extraordinary exam period)

In order to pass the subject in the extraordinary session, students must obtain a mark of **at least to 5.0 out of 10.0 points** in all parts of the evaluation of the subject that they had not passed during the ordinary call.

Any activities failed in the ordinary session must be submitted, taking into account the corresponding corrections or indications by the teacher. Those activities not submitted on the ordinary call must be delivered at the extraordinary session.

The final mark will be the weighted average of the partial marks of each of the approved activities (at least 5 out of 10 points), according to the table above. For this calculation the mark of the assessable activities passed in the ordinary session will be maintained.

8. SCHEDULE

This section indicates the schedule with dates for submitting evaluable activities for the subject:

Assesable activities	Date
On-site knowledge tests	Exam 1: November 2025 Exam 2: January 23rd 2026 Exam 3: May 25th 2026
Oral presentations	Week 11 (second semester)
Reports and essays	Week 4 (first semester) Week 11 (first semester) Week 8 (second semester) Week 13 (second semester)
Cases/problems	Weeks 5 (first semester) Weeks 9 (first semester) Week 12 (first semester) Week 10 (second semester) Week 14 (second semester)
Laboratory activities assessment	Session 1: November 12th 2025 Session 2: November 19th 2025 Session 3: December 10th 2025 Session 4: January 20th 2026 Session 5: 14th April 2026

This schedule may be subject to changes due to logistical reasons. Students will be notified of any changes in a timely manner.

9. BIBLIOGRAPHY

The reference works for following the subject are:

- Unglaub Silverthorn, D.U. (2019). Human Physiology: An Integrated Approach. 8th Edition. Pearson.
- Tortora, G.J; Derrickson, B.H. (2017). Tortora's Principles of Anatomy and Physiology. 15th Edition. Wiley.
- Taiz, L.; Zeiger, M. (2022). Plant physiology and development, 7th Edition. Sinauer Associates, Inc.

Recommended bibliography is provided below:

- Guyton, Arthur C; Hall, John AND. (2021). Treaty of Physiology Doctor. Barcelona: Elsevier Health
- Hall, J.E.; Hall, M.E. (2025). Guyton and Hall Textbook of Medical Physiology. 15th Edition. Elsevier.
- Purves, D.; Augustine, G.; Fitzpatrick, D.; Hall, W.; LaMantia, A.; White, L.; Mooney, R.; Platt, M. (2018). Neuroscience. 6th Edition. OUP USA.
- Kleine, B.; Rossmanith, W.G. (2016). Hormones and the Endocrine System: Textbook of Endocrinology. 1st Edition. Springer.
- Bhatla, S.C.; Lal M.A. (2018). Plant physiology, development and metabolism, 1st Edition. Springer.

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

At the Educational Guidance and Diversity Unit (ODI) we offer support to our students throughout their university life to help them achieve their academic goals. The pillars of our action are the inclusion of students with specific educational support needs, universal accessibility in the different university campuses and equal opportunities.

Services offered:

1. Support and follow-up through personalized advice and plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made. These adjustments are made at methodology and evaluation level, in those students with specific educational needs, thereby pursuing equal opportunities for all students.
3. We offer students different extracurricular training resources to develop various skills that will enrich their personal and professional development.
4. Vocational guidance, by providing tools and advice to students with vocational doubts or who believe they have made a mistake in choosing a degree.

Students who need educational support can e-mail us at:

Students in need of educational support can e-mail us at:
orientacioneducativa@universidadeuropea.es

11. SATISFACTION SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in our satisfaction surveys to detect strengths and areas for improvement regarding the teaching staff, the degree and the teaching-learning process.

The surveys will be available in the survey space of your virtual campus or via your e-mail.

Your feedback is necessary to improve the quality of the degree.

Thank you very much for your participation.