COURSE DATA

DATA SUBJECT

Code: 34107
Name: Plant Physiology
Cycle: Undergraduate Studies
ECTS Credits: 4.5
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1201 - Degree in Pharmacy	Facultat de Farmàcia i Ciències de L'alimentació	1	Second quarter
1201 - Degree in Pharmacy	Facultat de Farmàcia i Ciències de L'alimentació	1	Second quarter
1211 - Double Degree in Pharmacy and Human Nutrition and Dietetics	Facultat de Farmàcia i Ciències de L'alimentació	1	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1201 - Degree in Pharmacy	Biology	BASIC
1201 - Degree in Pharmacy	Biology	BASIC
1211 - Double Degree in Pharmacy and Human Nutrition and Dietetics	Asignaturas obligatorias del PDG Farmacia-Nutrición Humana y Dietética	COMPULSORY

COORDINATION

MARCO PICO FRANCISCO

SUMMARY

The primary objective of studying Plant Physiology is the organisms which make up the plant kingdom. Plant Physiology should give students a basic knowledge of how plants work and their processes. Based on that, the basic makeup of the programme looks at all the processes of feeding, growth, continuity, and their relationship with their environment.

Students will study the major structural characteristics and plant anatomy, which is necessary in order to understand thereafter different physiological processes, hydraulics (absorption, transport, and loss of water in plants), mineral nutrition, and transport of phothosynthetic products. Metabolic photosynthesis will also be analysed, as well as that of nitrogen and sulphur. Secondary metabolism will also be introduced, where students will cover some of the enormous amount of chemical compounds used to improve colour, scent and flavor of flowers and fruits, to battle against predators and organisms that cause illness, and

even against their own neighbours.

Apart from the basic physiological plant processes, it is also important to know and understand the mechanisms which regulate growth and development, as well as their interaction with the environment. To this end, we will study the plant development looking at plant hormones, photoreceptors, plant movement, different processes during the life cycle, and the integration of all of them in space and time.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

It is highly recommended that apart from Biology, students have also studied mathematics, physics, and chemistry

COMPETENCES / LEARNING OUTCOMES

1201 - Degree in Pharmacy

Act with autonomy in learning, making informed decisions in different contexts, issuing judgements based on experimentation and analysis, and transferring knowledge to new situations.

Apply such knowledge to the professional world, contributing to the development of human rights, democratic principles, principles of equality between women and men, solidarity, environmental protection and promotion of a culture of peace with a gender pe

Apply the scientific method and acquire skills in handling the main bibliographic sources.

Collaborate effectively in work teams, assuming responsibilities and leadership roles and contributing to collective improvement and development.

Contribute to the design, development and implementation of solutions that respond to social demands, taking into account the Sustainable Development Goals as a reference.

Demonstrate critical and self-critical thinking in the field of the degree programme, considering aspects such as professional ethics, moral values and the social implications of the different activities carried out.

Gain a better understanding of the nature of biological associations.

Know and understand, within the field of the degree programme, gender inequalities in society; integrate different needs and preferences based on sex and gender into the design of solutions and problem solving.

Know and understand the general mechanisms of disease, as well as the alterations in the functions of our cells, organs, systems and apparatuses that give rise to disease manifestations, taking into account the implications of gender differences.

Know and understand the medical terminology and the syndromic expression.

Know how to apply knowledge specific to the field to the professional world.

Know how to communicate effectively, both orally and in writing, adapting to the characteristics of the situation and the audience.

Know how to interpret, evaluate and communicate relevant data in the different areas of pharmaceutical activity, using information and communication technologies.

Know practical experiments that can be carried out to demonstrate different hypotheses related to plant physiology.

Know the basic principles of plant functioning.

Know the cell cycle and its regulation.

Know the organisation of the plant body.

Know the structure of the cell and its evolution.

Module: Biology. Estimate biological risks associated with the use of substances and laboratory processes involved.

Module: Biology. Know the properties of cell membranes and the distribution of medicines.

Module: Biology. Know the structures of biomolecules and their transformations in the cell.

Module: Medicine and Pharmacology. Know and understand the structure and function of the human body, as well as the general mechanisms of disease; molecular, structural and functional alterations, syndromic expression and therapeutic tools to restore heal

Module: Medicine and Pharmacology. Know the properties and mechanisms of action of medicines.

Possess and understand knowledge in the different areas of study included in pharmacist training.

Propose creative and innovative solutions to complex situations or problems within the field of knowledge, to respond to diverse professional and social needs.

Transmit ideas, analyse problems and solve them with critical spirit, acquiring teamwork skills and assuming leadership when appropriate.

Understand and use basic scientific terminology related to the subject.

Understand cellular functioning in general terms.

Understand the basic principles of genome organisation, inheritance and biological diversity.

Understand the operation of basic equipment and techniques related to the subject.

Understand where different cellular processes take place.

DESCRIPTION OF CONTENTS

1. The plant body

2. Water balance of plants

3. Mineral nutrition

4. Translocation in the phloem

5. Photosynthesis: The light reactions

6. Photosynthesis: Carbon reactions

7. Assimilation of mineral nutrients (Nitrogen, nitrate and sulfur)

8. Secondary metabolism and plant defense

9. Phytohormones

10. Overview of plant growth and development

11. Photomorphogenesis and plant movements

12. The control of flowering

13. Fruit formation, growth and development

14. Seed maturation, dormancy and germination

15. Juvenility senescence and abscission

16. LABORATORY SESSIONS

- The plant body
- Determination of the water potential of cells
- Photosynthesis. The Hill reaction
- Phytohormones Gibberellin and cytokinins bioassays
- Seed germination

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	2,00
Theory	26,00
Seminar	2,00
Laboratory	15,00
Total hours	**45,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	4,00
Independent study and work	32,50
Preparation of lessons	24,00

Preparation for assessment activities	7,00
Resolution of case studies	0,00
Total hours	**67,50**

TEACHING METHODOLOGY

Theory classes.

For theory classes lectures will be given, since this method allows the lecturer to give key concepts to understanding the subject and recommend further detailed study. In some classes student participation will be used, both between students, and between students and lecturer.

Laboratory sessions.

In these classes students will be able to learn the practical applications of the knowledge gained in the theory classes.

During the activities, both theoretical and practical, examples of the applications of the contents of the subject in relation to the Sustainable Development Goals (SDGs), as well as in the proposed topics for coordinated seminars. This is intended to provide students knowledge, skills and motivation to understand and address these SDGs, while promoting reflection and criticism.

Tutorials.

Tutorials will be carried out in small groups, where the teacher will direct students about everything related to the learning process, both in global and concrete terms, including the supervision of tasks.

Seminars.

Practical seminars and monographic work-shops programmed to work out specific aspects of plant physiology in order to reinforce the learning process. These activities will be held according to these options:

1. A conference by a visiting professional
2. A presentation made by the students of a recent development related to plant physiology (this activity will be carried out either individually or as a work group, maximum four students).
3. A presentation made by the professor of a recent development related to plant physiology

After each seminar there will be a debate where the majority of the participation should be between students.

EVALUATION

Knowledge of theory and practice will be measured according to the following criteria:

Exams: Counts up to 9 points

The exam will include questions about knowledge acquired in the theory, laboratory sessions and seminars.

- Theory exam: 7 points
- Laboratory session exam: 2 point

In order to be eligible for examination, students must have attended the laboratory sessions. Non-attendance will mean students cannot pass the subject.

Continuous assessment: counts up to 1 point.

Continuous assessment tasks will be graded by means of multiple-choice questionnaires and/or open questions, assays, exercises or other similar activities. Those activities will be available as tasks at the VLE. Students will have a time limit to provide their answers. Evaluated activities will be scheduled when all lectures of a particular unit are completed. Alternatively, these questions or tasks could also be raised and evaluated during lecture sessions, tutorials and/or seminars sessions.

Seminars: Counts up to 0,5 points

Content, oral presentation and participation in the discussions raised will be evaluated. The mark obtained in the seminar sessions will count as a bonus on the final grade.

First Call

There will be an examination of the whole subject at the end of the semester/term. The exam may include short questions, long questions, and multiple choices questions. The exam will include questions that require the student to relate concepts that appear in different topics or that may be related to current issues or to the seminars. The exam will also include parts related to the laboratory sessions. The final grade will be obtained by adding the evaluated tasks (continuous evaluation, theoretical-practical written examination and seminar). In order for the grades for the continuous assessment and seminar to be added, at least 50% of the maximum score in the theoretical and practical exams must be obtained. In order to pass, the final grade must equal or exceed the final score of 5 points.

Second Call:

Students who do not obtain a pass in the first call should resit all of the theory and laboratory session

exams, with a maximum score of 9 points. The seminar and the continuous assessment marks obtained during the semester/term will be saved for this second call and added if appropriate.

Evidence of copying or plagiarism in any of the assessable tasks will result in failure to pass the subject and in appropriate disciplinary action being taken. Please note that, in accordance with article 13. d) of the Statute of the University Student (RD 1791/2010, of 30 December), it is the duty of students to refrain from using or participating in dishonest means in assessment tests, assignments or university official documents.

In the event of fraudulent practices, the "Action Protocol for fraudulent practices at the University of Valencia" will be applied (ACGUV 123/2020): https://www.uv.es/sgeneral/Protocols/C83sp.pdf

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