

**Plant Physiology**

Code: 100823  
ECTS Credits: 6

**2024/2025**

| Degree                        | Type | Year |
|-------------------------------|------|------|
| 2500251 Environmental Biology | OB   | 2    |

## Contact

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## Teachers

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## Teaching groups languages

You can view this information at the [end](#) of this document.

## Prerequisites

None

## Objectives and Contextualisation

Vegetal Physiology is the first subject of a set of 3 that form the matter of Plant Physiology. It is compulsory and is attended in the first semester of the second year.

The training objective of this subject is focused on the acquisition of competences within the framework of the theoretical and practical training of the student.

Vegetal Physiology has as its training objectives the acquisition of knowledge of the different levels of organization of the organisms in its operation

## Competences

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
- Carry out functional tests and determine, assess and interpret vital parameters.
- Communicate efficiently, orally and in writing.
- Integrate knowledge of different organisational levels of organisms in their functioning.
- Manage information
- Reason critically.

- Take sex- or gender-based inequalities into consideration when operating within one's own area of knowledge.
- Understand the bases of regulation of vital functions of organisms through internal and external factors, and identify environmental adaptation mechanisms.
- Work individually and in teams.

## Learning Outcomes

1. Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
2. Actuar en l'àmbit de coneixement propi avaluant les desigualtats per raó de sexe/gènere.
3. Apply tests and indexes to assess the functioning and development of plants.
4. Communicate efficiently, orally and in writing.
5. Interpret the interaction between the biochemical and physiological levels that determine the functioning of plants.
6. Interpret the physiological processes that regulate plant growth and reproduction.
7. Manage information
8. Reason critically.
9. Work individually and in teams.

## Content

General contents:

Master classes:

Concept and sources of information

Cellular wall

Water and nutrition relations

Absorption and transport mechanisms

Reduction and assimilation of C, N and S

Metabolism C3, C4 and CAM.

Introduction to secondary metabolism

Mechanisms of regulation of growth.

Phytohormones

Sensing systems

Regulation of development phases (germination, flowering, fruition, senescence)

Laboratory:

Water relations: Measurement of water potential and observation of plasmolysis in plant tissues

Photosynthesis: Study of the Hill reaction in isolated chloroplasts and their inhibition by DCMU, Stomatal opening and closure and Demonstration of CO<sub>2</sub> need.

Measurement of transpiration water loss and transpiration rate under different environmental conditions.

Observation of stomata in mono- and dicotyledonous plants.

Bioassay of cytokinin in barley leaf segments (*Hordeum vulgare*).

Determination of nitrate overfertilization

## Activities and Methodology

| Title                | Hours | ECTS | Learning Outcomes |
|----------------------|-------|------|-------------------|
| Type: Directed       |       |      |                   |
| Laboratory practices | 16    | 0.64 | 1, 2, 3, 8, 9     |
| Seminars             | 6     | 0.24 | 1, 2, 4, 7, 9     |
| Theoretical classes  | 30    | 1.2  | 1, 6, 5           |
| Type: Supervised     |       |      |                   |
| Group tutorials      | 3     | 0.12 | 2, 6, 5           |
| Type: Autonomous     |       |      |                   |
| Personal Study       | 38    | 1.52 | 7, 6, 5           |
| Reading texts        | 30    | 1.2  | 8, 9              |
| Report writing       | 20    | 0.8  | 4, 9              |

The teaching methodology runs on lectures, virtual lectures, seminars, tutorials, personal study, as well as laboratory practices that combine individual and team work

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Assessment

### Continuous Assessment Activities

| Title                    | Weighting | Hours | ECTS | Learning Outcomes |
|--------------------------|-----------|-------|------|-------------------|
| 1st written partial test | 35%       | 1.5   | 0.06 | 6, 5, 8           |
| 2nd written test         | 40%       | 1.5   | 0.06 | 6, 5, 8           |
| Laboratory practices     | 10%       | 2     | 0.08 | 1, 2, 3, 9        |
| Seminars                 | 15%       | 2     | 0.08 | 1, 2, 3, 4, 7, 9  |

The specific and transversal competences of this subject will be evaluated by means of written tests (exams), questionnaires, oral presentations, participation in seminars and tutorials.

The written tests will be worth 75% of the final weight of the subject. It consists of two partial tests (first partial test 35% and second partial test 40%).

Students who have not submitted to any of the written tests, or who have submitted have not approved, will have to recover the part or parts suspended in a final exam. To pass the subject, or to eliminate the subject in the partial exam, you will have to obtain a minimum grade of 5.0 in each of the written tests.

To pass the mark of the subject, students must present themselves to a final exam of the whole subject, taking into account that the mark that will be counted will be the one of this last examination (that is to say, resigning to the notes previously obtained in the subject).

To participate in the recovery, the students must have previously been evaluated in a set of activities whose weight equals to a minimum of two thirds of the total grade of the subject or module. Therefore, students will obtain the "Non-Valuable" qualification when the evaluation activities carried out have a weighting of less than 67% in the final grade.

Laboratory practices: For the evaluation of practices, a final individual written test will be done and it will account for 80% of the practice mark. The practice notebook will be carried out in groups and will account the remaining 20% of the mark. The notebook will be delivered via Virtual Campus one week after the end of the practical course. Attendance is mandatory and the attitude is evaluated. There is no recovery practices exam. The weight of the practices in the final mark of the subject is 10%.

To be able to attend, it is necessary for the student to justify having passed the biosafety and security tests that he will find in the Virtual Campus and be knowledgeable and accept the rules of operation of the laboratories of the Faculty of Biosciences.

Seminars / Problems: The quality of the preparation and presentation of public works or exhibitions as well as the answers to the questions and problems proposed will be assessed. Seminars cannot be recovered. The evaluation of the seminars has a global weight of 15% of the final grade.

#### Unique assessment:

This subject contemplates the single assessment which consists of a single synthesis test in which the contents of the entire theory program will be assessed. The test will consist mostly of questions to be developed and some shorter questions in different formats. The grade obtained in this synthesis test will account for 75% of the final grade of the subject.

The assessment of practical activities, seminars and the delivery of assignments will follow the same process as the continuous assessment, and the grade obtained will represent 10% and 15% of the final grade of the subject respectively.

The single assessment test will coincide with the same date fixed in the calendar for the last continuous assessment test and the same recovery system will be applied.

## **Bibliography**

BARCELÓ, J.; NICOLÁS, G.; SABATER, B.; SÁNCHEZ, R.: *Fisiología Vegetal*. Pirámide. Madrid (2007).

MOHR, H.; SCHOPFER, P.: *Plant Physiology*. Springer Verlag, Berlin (1995).

SALISBURY, F.B.; ROS, C. W.: *Plant Physiology*, 4th edition. Wadsworth Publ. Company, Belmont, California (1992).

SCHOPFER, P.; BRENNICKE, A.: *Pflanzenphysiologie*, Elsevier, Spektrum (2006).

TAIZ, L.; ZEIGER, E.: *Plant Physiology*, several editions

## **Software**

no software is used

## Language list

| Name                          | Group | Language        | Semester       | Turn          |
|-------------------------------|-------|-----------------|----------------|---------------|
| (PAUL) Classroom practices    | 221   | Catalan         | first semester | morning-mixed |
| (PAUL) Classroom practices    | 222   | Catalan         | first semester | morning-mixed |
| (PLAB) Practical laboratories | 221   | Catalan         | first semester | morning-mixed |
| (PLAB) Practical laboratories | 222   | Catalan         | first semester | morning-mixed |
| (PLAB) Practical laboratories | 223   | Catalan         | first semester | morning-mixed |
| (TE) Theory                   | 22    | Catalan/Spanish | first semester | afternoon     |