

**COURSE DATA****Data Subject**

<b>Code</b>	36358
<b>Name</b>	Vegetal biology
<b>Cycle</b>	Grade
<b>ECTS Credits</b>	6.0
<b>Academic year</b>	2022 - 2023

**Study (s)**

<b>Degree</b>	<b>Center</b>	<b>Acad. year</b>	<b>Period</b>
1212 - Degree in Gastronomic Sciences	Faculty of Pharmacy and Food Sciences	1	Second term

**Subject-matter**

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
1212 - Degree in Gastronomic Sciences	1 - Biology	Basic Training

**Coordination**

<b>Name</b>	<b>Department</b>
GONZALEZ MAS, MARIA DEL CARMEN	25 - Plant Biology
RENAU MORATA, BEGOÑA	25 - Plant Biology

**SUMMARY**

Plant Biology is a basic course during the first year of the Gastronomic Sciences Degree. We have a theoretical-experimental approach to the topic, so classroom lectures are combined with practical activities. These include laboratory work to recognize the diversity, composition and structures of plants, fungi and alga. As well as a series of activities to complete the formation of the recognition of species and varieties of culture, through group activities.

The compulsory Biology module of the first year includes both Plant Biology and Animal Biology. Students acquire basic knowledge on the level of cellular organization of living organisms. In Plant Biology we focus the learning on the higher level of organization of plants, fungi and algae.

Vegetables, as photosynthetic organisms constitute the primary suppliers of oxygen to the atmosphere and the mainstay of the food chain. Human food is based on plants and animals that provide fiber, vitamins, protein, fats, etc. In addition, vegetables are a source of valuable raw materials for the food industry (starch, sugars, sweeteners, antioxidants, emulsifiers, coloring, flavoring). We aim at providing a basic understanding on how plants, fungi and algae work and also on their diversity. This knowledge is crucial



for technological approaches to increase the quality of those raw materials industry demands.

We will assess different taxa by exploring diversity. We will focus on products with gastronomical interest, emphasizing the Mediterranean diet.

The **main objective** is that students tackle the diversity of fungi, algae and plants by understanding the key concepts to get to know their complexity and importance in Gastronomy. Specifically, the student must recognise the different species and varieties of vegetables, fruits, nuts, grains, seeds and sprouts, spices and herbs, mushroom species (suitable for consumption) and other seafood (algae). We will pay more attention to those traditionally related to the Mediterranean diet.

## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

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

### Other requirements

## OUTCOMES

### 1212 - Degree in Gastronomic Sciences

- Understand cell function in general terms.
- Students must have acquired knowledge and understanding in a specific field of study, on the basis of general secondary education and at a level that includes mainly knowledge drawn from advanced textbooks, but also some cutting-edge knowledge in their field of study.
- Students must be able to apply their knowledge to their work or vocation in a professional manner and have acquired the competences required for the preparation and defence of arguments and for problem solving in their field of study.
- Students must be able to communicate information, ideas, problems and solutions to both expert and lay audiences.
- Students must have developed the learning skills needed to undertake further study with a high degree of autonomy.
- Plan, order and channel activities in such a way that unforeseen events are avoided as much as possible, possible problems are foreseen and minimised, and solutions are anticipated.
- Acquire the basic training needed to formulate hypotheses, gather and interpret information for solving problems using the scientific method, and understand the importance and the limitations of scientific thinking.
- Be able to engage in new fields of gastronomy in general through independent study.



- Be able to work in a team and to organise and plan activities, always taking account of gender perspective.
- Resolve tasks or carry out work in the time allotted while maintaining the quality of the result.
- Be able to construct an understandable and organised written text.
- Be able to distribute time appropriately for carrying out individual or group tasks.
- Be able to take the approaches required to reduce a problem to a manageable level.
- Be able to understand the levels of organisation of the body of plants.
- Know the operation of basic appliances and techniques related to the biology of food raw materials.

## LEARNING OUTCOMES

- To know the basic operation of devices and techniques related to the subject
- To understand and handle basic scientific terminology related to the subject
- To know the levels of organization of plants, fungi and algae
- To know the basic plant physiological processes
- Knowing how to find the appropriate literature to update and deepen their knowledge on a specific topic
- Handled safely and efficiently in a laboratory
- To know how to present and interpret the results obtained at the laboratory

## DESCRIPTION OF CONTENTS

### 1. Plants

- 1.1. Evolutionary history of plants. Plants in the context of plant biology. General characteristics. Diversity.
- 1.2. Higher plants. General characteristics and vegetative organization.
- 1.3. Higher plants. Development and reproduction. Flower and fruit of angiosperms. The seed.
- 1.4. Plant metabolism. Primary metabolism. Photosynthesis and respiration.
- 1.5. Plant metabolism. Secondary metabolism. Aromatic plants and spices. Flowers.
- 1.6. Main edible vegetable species I. Fruits, tubers, root and vegetable.
- 1.7. Main edible vegetable species II. Nuts, grains and seeds gastronomic
- 1.8. Industrial cultivation of plants and postharvest technology. Systems, technical and environmental factors of plant production. Biological and environmental factors involved in post-harvest spoilage. Postharvest conservation methodologies plant products.
- 1.9. Plant biotechnology. Breeding techniques. Transgenic plants.



## 2. Fungi

- 2.1. General characteristics of vegetative body, development, nutrition, metabolims and reproduction.
- 2.2. Diversity of species of gastronomic importance. Metabolism use of fungi in food.
- 2.3. Compounds biosynthesized by fungi agrifood interest.
- 2.4. Industrial production and commercialization. Systems, technical and environmental factors

## 3. Algae

- 3.1. General characteristics of vegetative body, development, nutrition, metabolims and reproduction.
- 3.2. Diversity of species of gastronomic importance.
- 3.3. Algae compounds of gastronomic importance
- 3.4. Industrial production and commercialization. Systems, technical and environmental factors

## 4. LABORATORY AND CLASSROOM PRACTICES

- Practice 1. Extraction of essential oils by hydrodistillation
- Practice 2. Visualisation of characteristic elements and organs of food-producing plants
- Practice 3. Evaluation of changes in the texture during the postharvest of fruits and vegetables
- Practice 4. Study of the obtaining of sprouts, sprouts and micro-plants

## 5. VISITS

Visit to the Botanical Garden and the Central Market of Valencia. In both outputs will perform a recognition of species and cultivars of aromatic plants, vegetable and fruits, as well as its processed and unprocessed edible products. In addition, in the case of the Central Market, emphasis will also be placed on commercialized products related to fungi and algae.

## WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	45,00	100
Laboratory practices	15,00	100
Development of group work	5,00	0
Development of individual work	5,00	0
Study and independent work	15,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	40,00	0
Preparing lectures	15,00	0
Preparation of practical classes and problem	5,00	0
<b>TOTAL</b>	<b>150,00</b>	





## TEACHING METHODOLOGY

In Plant Biology the students are the leaders of their own learning. The topic has four sections:

**1. Theoretical sessions (39 hours).** The master class model and active learning systems will be used. The master class offers the possibility for the lecturer to emphasise the key concepts for the understanding of the subject and the most recommendable resources for the subsequent in-depth preparation of the subject will be indicated. In some subjects, the participatory model will be used, with communication between students and between students and teachers prevailing. For active learning, work may be done, among others, with problem-based learning, inverted class and gamification.

**2. Practical classes (7.5 hours).** These classes will elaborate on the specific application of the knowledge students have acquired during the lectures. It includes classroom and practical laboratory sessions.

**3. Visits (7.5 hours).** Some visits to the Jardí Botànic of the UV will be organized. It is possible that a visit will also be made to the Mercat Central

Attendance at 75% of the practical laboratory sessions and visits is compulsory.

**4. Seminars (6 hours).** The seminars will be used in the presentation of a current topic or thematic workshops by students. After each presentation, the debate on the theme of the seminar will encourage and ensure that the role of the seminars rests primarily on students and their participation in the oral debate. Attendance at the seminar sessions is compulsory.

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) will be pointed out. This is intended to provide students with knowledge, skills and motivation to understand and address these SDGs, while promoting reflection and criticism.

## EVALUATION

The knowledge acquired in theoretical and practical classes will be assessed. To evaluate and to pass the subject is essential to have attended all of the practice sessions given their compulsory nature.

- Theoretical and practical examination: (7 points). The test will include questions on the lectures (6 %) and practices / visits (1 %). The exam questions include questions about knowledge acquired in the theoretical and practical sessions/visits and may be short questions, questions of multiple choice or questions relating different aspects of the subject. The minimum score to add the rest of the marks is 3.5.

-Continual assessments: (2 points) Obtained from the sum of the notes of the projects that will be worked during the course. Students will work in groups of 3-4 people. The projects will work on real cases related to the subject. This mark can only be added to the exams one during the same academic year.



-Seminars (1 point): Students in groups of 3-4 students must complete as assignment on a topic related to the course. The subject can be proposed by them or selected from those proposed by the teacher. The contents and the presentation of the seminar will be evaluated. The mark obtained from the seminar may be added to the mark of the exam only in the current academic year.

**First Call:** an examination of the whole subject will be held at the end of the semester. The final mark will be the sum of the parts to be evaluated. So that the various parts can be added, they must gain at least 4 points in the exam. Students who do not attend the theoretical and practical examination will appear in the official mark sheet as non-attending.

**Second call:** A student who has not passed the examination in the first call, should be examined in all the theoretical and practical part. The marks for seminars and continuous assessment will be kept for this exam session.

## REFERENCES

### Basic

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### Additional

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