

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

Code	36358
Name	Vegetal biology
Cycle	Grade
ECTS Credits	6.0
Academic year	2020 - 2021

Study (s)

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

Subject-matter

Degree	Subject-matter	Character
1212 - Degree in Gastronomic Sciences	1 - Biology	Basic Training

Coordination

Name	Department
MUÑOZ BERTOMEU, JESUS	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. Also, we schedule visits to the Central Market of Valencia and to the Botanical Garden of the University of Valencia. Our aim is 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 nutrition
- 1.4. Reproduction. Flower and fruit of angiosperms. The seed.
- 1.5. Aromatic plants and spices. Main species and parts used in food.
- 1.6. Flowers and fruits. Main edible species
- 1.7. Tubers, root and vegetable. Species of culinary interest
- 1.8. Nuts, grains and seeds gastronomic
- 1.9. Industrial cultivation of plants. Systems, technical and environmental factors of plant production.



Climate, soil and fertilization.

1.10. Postharvest technologies. Biological and environmental factors involved in post-harvest spoilage. Postharvest conservation methodologies plant products.

1.12. 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

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
TOTAL	150,00	



TEACHING METHODOLOGY

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

1. Theoretical sessions (39 hours). Fundamentally, the lecture model will be used, as it offers the possibility that the teacher impinge on key concepts for the understanding of the subject and will indicate the most suitable resources for further in depth preparation of the subject. On some issues, the participatory model will be used, giving priority to communication between students and between students and teacher.

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. One session will take place in the.

3. Visits (7.5 hours). We will visit the Central Market and Botanical Garden of the University.

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.

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 4.5.

-Continual assessments: (2 point) 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.

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 4,5 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 with a maximum mark of 10 points.



REFERENCES

Basic

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Additional

- Trends in Plant Science. Elsevier Science Ltd. Revista mensual con actualizaciones sobre temas relacionados con la fisiología de las plantas.
- Cole, KM and Sheath RG. 2011. Biology of the Red Algae. Cambridge University Press
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- Strasburger, E. (2003) Tratado de Botánica. Editorial Omega
- Bon M. 2005. Guía de campo de los hongos de España y de Europa. Omega
- <http://www.plantcell.org/site/teachingtools/teaching.xhtml>
- <http://5e.plantphys.net/index.php> <http://croptechnology.unl.edu/pages/>

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

1. Contents

Most of the contents initially collected in the teaching guide are maintained, although the syllabus is readjusted to facilitate the acquisition of competencies through project work.



2. Volume of work and temporal planning of teaching

Schedules are maintained, but class time can be set aside for group work. The time required to carry out the work has been adjusted to the ECTS credits for the period affected by the health situation.

3. Teaching methodology

If the usual presence is not feasible, it will be carried out through:

Synchronous classes in Blackboard Collaborate. Creation and upload of support materials to the virtual classroom adjusted to non-face-to-face teaching.

Proposal of activities by virtual classroom. The proposed works and the presentation of the topic are narrated in Powerpoint.

A chat will be used in the virtual classroom to answer questions. In addition, individualized tutorials will be held from 9 am to 2 pm and from 7 to 7 pm through a link to the Blackboard Collaborate of the virtual classroom.

Development of projects in groups of up to 4 people.

Half face-to-face practice half at home. Because the practice groups must be of 8 people maximum, practices will be developed that students can easily work at home with material that usually exists in our homes. The groups and home/practice shifts will be uploaded so that students are clear about where they should do the practices in each session.

If a state of total confinement were to occur, all face-to-face teaching would be carried out online.

4. Evaluation

If the evolution of the current pandemic allows it, it will be face-to-face and in the terms indicated in the teaching guide. Only in case this is not possible, the evaluation will be carried out by:

Adding continuous assessment activities

Increase in weight in the final grade of the continuous assessment

Increase in weight in the seminar grade

The evaluation will be as follows:

-Exam: Multiple choice test that will be carried out in the virtual classroom. 20% of the grade

-Seminar: Seminar to be carried out in groups or individually. A multimedia file with the work will be presented. The rest of the students will be able to see it. The mark will be obtained from a peer evaluation (10%), by means of a rubric and the teacher's evaluation (10%). 20% of the note.

-Works: must be done in groups or individually. They must carry out 4 jobs of those that are proposed from the beginning of the course to the end. 50% note.

-Work that replaces face-to-face practice: Work that must be presented to replace the laboratory practices that have not been done. 10% of the note.



5. Bibliography

It is not modified

