Course guide
390107 - BV - Plant Biology

Unit in charge: Barcelona School of Agri-Food and Biosystems Engineering
Teaching unit: 745 - DEAB - Department of Agri-Food Engineering and Biotechnology.

Degree: BACHELOR’S DEGREE IN BIOSYSTEMS ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR’S DEGREE IN FOOD ENGINEERING (Syllabus 2009). (Compulsory subject).
BACHELOR’S DEGREE IN AGRONOMIC SCIENCE ENGINEERING (Syllabus 2018). (Compulsory subject).

Academic year: 2022   ECTS Credits: 6.0   Languages: Catalan

LECTURER

Coordinating lecturer: Mas Serra, Maria Teresa

Others: Serrano Porta, Lidia
Izquierdo Figarola, Jordi
Bort, Jordi
Sánchez, Rut
Morales, Melanie
Verdú González, Antonio Maria

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Identification and characterization of vegetal species.

Transversal:
3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.

TEACHING METHODOLOGY

The hours of directed learning consist:
- Theoretical classes (large group), the teacher makes an exhibition of three parts: (1) introduce the learning objectives, (2) present the basic concepts (3) search for the implication of students from one or more questions in order to relate these concepts.
- Practical classes (small group) to encourage students to carry out activities that are proposed and described in the scripts of practices, in order to learn various methodologies involved in Plant Biology.
- Guiding students in the elaboration of deliverable work of bibliographic research, in order to recognize and consult the information sources to perform specific work, as well as support for the realization and synthesis of experimental results work.

The student has support material (such as diagrams and photographs to support the theory classes, issue papers, the script of practical references to complementary readings, link to thematic Internet pages, etc.) to ATENEA. It also promotes independent learning, particularly through the deliverable work and through the interaction that is looking for at the theoretical classes.
LEARNING OBJECTIVES OF THE SUBJECT

After Vegetal Biology subject, the student should be able to:
- Understand the general life cycle of plants with seed and recognize the main morphological features.
- Assimilate the system of determination of seed plants and know the major groups of plants with ethnobotanical and economic interest.
- Understand the basics of nutrition and transport in higher plants and know their impact on plant production.
- Understand the processes that comprise the plant development and its hormonal control and identify the main applications in the area of artificial regulation.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>40,0</td>
<td>26.67</td>
</tr>
<tr>
<td>Hours small group</td>
<td>20,0</td>
<td>13.33</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

ANATOMY AND MORPHOLOGY OF CORM

Description:
In this theme are studied plants as complex creatures with a vegetative development which, although follows common guidelines can lead to morphologies and diverse lifestyles.
It works:
- Tissue systems
- The embryonic organs, primary and secondary growth.
- The anatomy and morphology of roots, stems and functional leaves, emphasizing those tissues or organs that can present interesting changes in agricultural production and in the vegetative propagation.

Related activities:
Activity 1: Theory classes
Activity 2: Individual test content 1, 2 and 3
Activity 4: Bibliographic research content 1

Full-or-part-time: 31h
Theory classes: 6h
Self study: 25h
BIOLOGY OF REPRODUCTION OF PLANTS

Description:
This content is devoted to the biology of reproduction. It works:
- The types of life cycles
- Flowers and inflorescences. Formation of male and female gametes.
- Pollination, fecundation, embryo development, seed and fruit formation.
- Types of fruits. Dispersal of fruits and seeds.
- Germination and epigea hipogea.

Related activities:
Activity 1: Theory classes
Activity 2: Individual test

Full-or-part-time: 20h
Theory classes: 10h
Self study : 10h

DIVERSITY OF PLANTS, IDENTIFICATION AND DETERMINATION

Description:
Content on this work:
- The diversity in the morphology of the reproductive organs (flowers and fruits).
- The relationship between the morphology of the reproductive organs and the taxonomic position of species. The relationship between taxonomy and phylogeny
- The characteristics of the main groups of plants of economic and ethnobotanical interest

Related activities:
Activity 1: Theory classes
Activity 2: Individual test
Activity 5: Laboratory
Activity 6: Individual continued assessment test in laboratory.

Full-or-part-time: 24h
Theory classes: 4h
Laboratory classes: 10h
Self study : 10h
TRANSPORTATION AND TRANSLOCATION OF WATER AND SOLUTES

Description:
In this theme are studied water and mineral nutrition of higher plants, emphasizing the key role of the root-soil interface in the context of the system SPAC (soil-plant-atmosphere continuum). It works:
- Water the plants.
- Transpiration and stomatal control.
- Nutrients and symptoms of nutritional deficiency.
- Absorption and transport of nutrients.
- Stem transport

Related activities:
Activity 1: Theory classes
Activity 3: Individual test
Activity 7: Research work
Activity 8: Laboratory

Full-or-part-time: 28h
Theory classes: 7h
Laboratory classes: 5h
Self study: 16h

PLANT BIOCHEMISTRY AND METABOLISM

Description:
The content focuses on the study of hydrocarbonated nutrition and metabolism of higher plants, to understand, together with the content, the bases of atrophy plant and its involvement in the food web. It works:
- Photochemical phase of photosynthesis.
- Biochemical phase of photosynthesis.
- Plant respiration.
- The limiting factors and agronomic and ecological aspects of photosynthesis.
- Phloem transport and delivery of assimilated.
- Assimilation of nitrogen and sulfur

Related activities:
Activity 1: Theory classes
Activity 3: Individual test
Activity 7: Research work

Full-or-part-time: 20h
Theory classes: 7h
Self study: 13h
PLANT DEVELOPMENT

Description:
In this content it points out the basic concept of growth, cell differentiation and morphogenesis as structural elements in the development of higher plants, and studies the major internal and external regulatory elements of the processes of plant development.
It works:
- Plant development and regulation endogenous and exogenous.
- Photomorphogenic and light as a regulator of plant development.
- Hormones plant.
- Control of flowering and fruit development and seed.
- Life at rest.
- Senescence and abscission.

Related activities:
Activity 1: Theory classes
Activity 3: Individual test
Activity 7: Research work
Activity 8: Laboratory
Activity 9: Preparation and delivery practices questionnaire.

Full-or-part-time: 27h
Theory classes: 6h
Laboratory classes: 5h
Self study : 16h

ACTIVITIES

(ENG) ACTIVITY 1. THEORY LESSONS

Full-or-part-time: 40h
Theory classes: 40h

(ENG) ACTIVITY 2. INDIVIDUAL TEST (CONTENTS 1,2 AND 3)

Full-or-part-time: 1h 30m
Theory classes: 1h 30m

(ENG) ACTIVITY 3. INDIVIDUAL TEST (CONTENTS 4,5 AND 6)

Full-or-part-time: 1h 30m
Theory classes: 1h 30m

(ENG) ACTIVITY 4. LABORATORY

Full-or-part-time: 10h
Laboratory classes: 10h
(ENG) ACTIVITY 5: LABORATORY EVALUATION TESTS

Full-or-part-time: 1h
Laboratory classes: 1h

(ENG) ACTIVITY 6. LABORATORY

Full-or-part-time: 10h
Laboratory classes: 10h

GRADING SYSTEM

The final qualification of this subject, N_{final}, is calculated with the follow system:

N1: qualification of the writing test related to the contents 1 and 2.
N2: qualification of the writing test related to the contents 4, 5 and 6.
N3: qualification of the writing test related to the contents 3.
N4: deliverables qualification of the practices related to the contents 4 and 6.

\[ N_{final} = 0.325 \times N1 + 0.35 \times N2 + 0.175 \times N3 + 0.15 \times N4 \]

If you have failed the subject (final mark), you will be able to re-evaluate the contents of the course (1, 2, 3, 4, 5 and 6) corresponding to the qualifications N1, N2, N3, and N4 through a global writing exam.

EXAMINATION RULES.

It is a necessary condition to have presented all the documents related to the evaluation to pass the subject.

BIBLIOGRAPHY

Basic:

Complementary: