

Year : 2018/19

28930 - Horticultural production

Syllabus Information

Academic Year:	2018/19
Subject:	28930 - Horticultural production
Faculty / School:	201 -
Degree:	437 - Degree in Rural and Agri-Food Engineering
ECTS:	6.0
Year:	3
Semester:	Second semester
Subject Type:	Compulsory
Module:	---

General information

Aims of the course

Context and importance of this course in the degree

Recommendations to take this course

Learning goals

Competences

Learning goals

Importance of learning goals

Assessment (1st and 2nd call)

Assessment tasks (description of tasks, marking system and assessment criteria)

Methodology, learning tasks, syllabus and resources

Methodological overview

This course studies the techniques of horticultural crop and crop characteristics of the main vegetables. It is divided into two main sections. In the first general aspects of horticulture and greenhouse technology are addressed and in the second the agronomic characteristics of the main species of vegetables are studied.

Theoretical lessons in classroom.

Practical sessions in lab

Tutorial sessions.

Field visits.

Learning tasks

I. General aspects of horticulture and greenhouse technology. Theoretical and practical lessons.

II. Characteristics of the main species of vegetables Theoretical and practical lessons.

III. Field visits.

Syllabus

Theoretica Programme

1. Introduction. Horticulture across the world, within the European Union and in Spain. Importance and principal characteristics of the sector.

2. Climate in horticulture. Climatic factors: light, temperature, water and wind. Carbon fertilisation.

3. Soil in horticulture. Organic and mineral fertilisation. Horticulture in specific soils. Cultivation in sand. Hydroponic crops. Nutritive solutions.

4. General techniques within horticultural cultivation. Propagation. Seedbeds. Ploughing. Irrigation. Use of growth regulators.

5. General cultivation techniques in horticulture. Crop rotation and the alternatives. Soil disinfection. Plant health defence and weed control.

6. Harvesting of horticultural products. General guidelines. Harvesting systems. Conservation of horticultural products. Postharvest handling. Conservation systems. Markets for horticultural products. Marketing standards and methods.

7. Horticultural plants cultivated for their roots. Species. Botanical classification. Economic importance. The carrot. Cultivation techniques.

8. Horticultural plants cultivated for their tubers. Species. Botanical classification. Economic importance. The potato. Cultivation techniques.

9. Horticultural plants cultivated for their bulbs. The *Allium* genus. Botanical classification. Economic importance. The onion and its cultivation techniques. Garlic and its cultivation techniques.

10. Horticultural plants cultivated for their stems. The asparagus. Economic importance. Cultivation techniques.
11. Horticultural plants cultivated for their leaves. Species. Botanical classification. Economic importance. The *Brassica* genus. Cultivation techniques. The lettuce and the endive and their cultivation techniques.
12. Horticultural plants cultivated for their inflorescence. Species. Botanical classification. The artichoke. Cultivation techniques.
13. Horticultural plants cultivated for their fruit. The solanaceae family. Botanical classification. Economic importance. Cultivation techniques of the tomato, the pepper and the aubergine.
14. Horticultural plants cultivated for their fruit. The cucurbitaceae family. Species. Botanical classification. Economic importance. Cultivation techniques.
15. Horticultural plants cultivated for their fruit. The strawberry. Species. Botanical classification. Economic importance. Cultivation techniques.
16. Horticultural plants cultivated for their pods/seeds. Species. Botanical classification. Economic importance. Cultivation techniques.
17. Cultivated mushrooms. General features. Taxonomy. Description. The common mushroom. Cultivation techniques. Other edible fungi.

Practical Programme

1. Crop programming. Crop calendar. Outdoor crops and protected cultivation.
2. Greenhouses. General characteristics. Greenhouse design. Types of cover. Thermal requirements. Estimation of heating needs.
3. Greenhouse design. Estimation of refrigeration needs. Refrigeration requirements in greenhouses. Design of a cooling system.
4. Recognition of the seeds of a variety of horticultural plants.
 - 4.1.- The solanaceae family (pepper, aubergine, tomato)
 - 4.2.- The asteraceae family (cardoon, artichoke, lettuce, escarole, endive, salsify)
 - 4.3.- The apiaceae family (celery, fennel, carrot, parsnip, parsley)
 - 4.4.- The cucurbitaceae family (melon, cucumber, watermelon, courgette, pumpkin)
 - 4.5.- The liliaceae family (asparagus, onion, leek, garlic)
 - 4.6.- The poaceae family (sweetcorn)
 - 4.7.- The rosaceae family (strawberry)
 - 4.8.- The brassicaceae family (turnip, cabbage, cauliflower, Roman cauliflower, broccoli)
 - 4.9.- The chenopodiaceae family (chard, beetroot, spinach)
 - 4.10.- The boraginaceae family (borage)
 - 4.11.-The leguminosae family (beans, peas)
5. Recognition of the plantlets of a variety of horticultural plants.
 - 5.1.- The solanaceae family (pepper, aubergine, tomato)
 - 5.2.- The asteraceae family (cardoon, artichoke, lettuce,

escarole, endive, salsify).5.3.- The apiaceae family (celery, fennel, carrot, parsnip, parsley).5.4.- The cucurbitaceae family (melon, cucumber, watermelon, courgette, pumpkin).5.5.- The liliaceae family (asparagus, onion, leek, garlic)5.6.- The poaceae family (sweetcorn)5.7.- The rosaceae family (strawberry)5.8.- The brassicaceae family (turnip, cabbage, cauliflower, Roman cauliflower, broccoli)5.9.- The chenopodiaceae family ((chard, beetroot, spinach).5.10.- The boraginaceae family (borage)

5.11.- The leguminosae family (beans, peas)

6. Substrata for horticulture.

7. Quality standards relating to the sale of vegetables.

8. Establishment of horticultural alternatives.

9. Vegetable grafting.

External visits:

Visits to a substratum production plant, a mushroom farm and a mushroom processing company in Autol-Pradejón in the province of La Rioja. Visit to an intensive horticultural farm near Zaragoza.

Course planning and calendar

Week	theoretical sessions and problems	Hours	Practical sessions	Hours	Activity
1	Theme 1	2	Practice 1	2	
2	Theme 2	2	Practice 2	2	
3	Theme 3	2	Practice 2	2	
4	Theme 4 y 5	2	Practice 2	2	
5	Theme 6	2	Practice 3	2	
6	Theme 7 y 8	2	Practica 3	2	
7	Theme 9	2	Practice 4	2	
8	Theme 10	2	Practice 4	2	
9	Theme 11	2	Practice 5	2	

10	Theme 12	2	Practice 5	2	
11	Theme 13	2	Practice 5	2	
12	Theme 14	2	Practice 6	2	
13	Theme 15	2	Practice 7	2	
14	Theme 16	2	Practice 8	2	delivery of work
15	Theme 17	2	Practice 9	2	
Total		30 hours		30 hours	

Bibliography and recommended resources

- BB** Alpi, A. Cultivo en invernadero : actual orientación científica y técnica / A. Alpi, F. Tognoni ; versión española [de la 4a ed. italiana], C.I. Cerisola, con la colaboración de E. Domínguez Castillo . 3a ed. rev. y ampl. Madrid : Mundi-Prensa, 1991
- BB** Maroto Borrego, José Vicente. Elementos de horticultura general : especialmente aplicado al cultivo de plantas de consistencia herbácea / J. V. Maroto Borrego . 2a ed. rev. y ampl. Madrid : Mundi-Prensa, 2000
- BB** Maroto Borrego, José Vicente. Horticultura herbácea especial / J. V. Maroto Borrego . 5ª ed. rev. y ampl. Madrid : Mundi-Prensa, 2002
- BB** Matallana Gonzalez, Antonio. Invernaderos : diseño, construcción y ambientación / Antonio Matallana Gonzalez, Juan Ignacio Montero Camacho. 2ª ed. rev. y ampl. Madrid : Mundi-Prensa, 1995
- BC** Castilla Prados, Nicolás. Invernaderos de plástico : tecnología y manejo / Nicolás Castilla . Madrid : Mundi-Prensa, 2005
- BC** Resh, Howard M.. Cultivos hidropónicos : nuevas técnicas de producción... / Howard M. Resh . 5a. ed., rev. y ampl. Madrid [etc.] : Mundi-Prensa, 2001
- BC** Tesi, Romano. Medios de protección para la hortoflorofruticultura y el viverismo / Romano Tesi ; versión española J. M. Mateo . Madrid [etc.] : Mundi-Prensa, 2001
- BC** Tratado de cultivo sin suelo / Miguel Urrestarazu Gavilán , director coordinador . 3ª ed., rev. y ampl. Madrid [etc.] : Mundi-Prensa, 2004

The updated recommended bibliography can be consulted in:
<http://psfunizar7.unizar.es/br13/egAsignaturas.php?id=8091>