

28438 - Beekeeping: Production and Health

Información del Plan Docente

Academic Year	2016/17
Academic center	105 - Facultad de Veterinaria
Degree	451 - Degree in Veterinary Science
ECTS	3.0
Course	
Period	Second semester
Subject Type	Optional
Module	---

1. Basic info

1.1. Recommendations to take this course

1.2. Activities and key dates for the course

2. Initiation

2.1. Learning outcomes that define the subject

2.2. Introduction

3. Context and competences

3.1. Goals

3.2. Context and meaning of the subject in the degree

3.3. Competences

3.4. Importance of learning outcomes

4. Evaluation

5. Activities and resources

5.1. General methodological presentation

The learning process that is designed for this subject is based on the following:

The theoretical class is structured into 8 thematic blocks, divided into 24 lessons and taught in 19 sessions (fifty minutes each), and 11 hours of practical training, divided into 6 hours of laboratory practices and 5 hours of field practices to visit apiaries and industries related with the sector.

The lectures will develop the theoretical concepts detailed in the program of the subject (see program). It is planned to

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deliver the documentation for each issue available to students in the virtual campus of the University (ADD) or in the reprographics service.

In the laboratory, the practical program detailed below (see program) is performed. The laboratory training consists in 6 hours of practice, distributed in 4 sessions. Initially an explanation of the session is taught and then students do the practice under the supervision of the teacher. Students will have a handbook of practical activities to work in the laboratory. Field practices consist in an visit to apiaries; to visit an apiary and melliferous flora and vegetation types identification around the beehives (3h) and an industry of bee products (honey, wax, propolis) (2h). In the activity, the teacher and the owner of the industry will be present.

5.2.Learning activities

The program offered to the student in order to achieve the expected results includes the following activities.....

Theoretical classes: 19 hours of theoretical activities, divided into 8 thematic blocks and consisting in 24 lessons.

Laboratory practice: 6 hours of practical training, divided into four sessions.

Field practices: 5 hours of field training consisting of supervised visits to apiaries and to industries and businesses in the sector.

5.3.Program

Theoretical teaching

1. Population, behaviour, requirements and management of a colony (2h)

Lesson 1.- Introduction: historical and current relevance of beekeeping. Anatomy, physiology and biology of the bee (*Apis Mellifera*). Worker, queen and drone. Biological cycle.

2. Genetics and Reproduction (3h)

Lesson 2.- Species and breeds. Breed concept in beekeeping. The ideal breed. Main species. Main European and African breeds of *Apis mellifera*. Asiatic breeds. Crossbreeds.

Lesson 3.- Queen bee and drone genital organs. Nuptial flights. Worker bee genital organs features.

Lesson 4.- Development. Sex determination and castes. Parthenogenesis.

Lesson 5.- Swarming and hive reproductive management.

Lesson 6.- Rearing queen bees and artificial insemination.

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3. Beekeeping production (2h)

Lesson 7.- The hive. Introduction. Hive types. General characteristics. Parts of a common hive. Equipment and materials in beekeeping. All it is needed to obtain honey and other products from the bees. General tools.

Lesson 8.- Management general in the practical beekeeping. Beekeeping calendar. Main activities to do before and after the honeydew. How prepare the hive to the winter time and other periods with low global activity.

4. Melliferous flora and vegetation (2h)

Lesson 9.- Melliferous flora and vegetation. Main plant resources for bees: nectar, pollen, honeydew, juices, propolis. Geographic areas with bee foraging resources.

Lesson 10.- Phenology and Transhumances.

Lesson 11.- Ecosystem services of Beekeeping: entomophilous pollination. Plant-bee co-evolution.

Lesson 12.- Assessment of the feeding value of melliferous vegetation types. Regional assessment.

5. Bee pathology (4h)

Lesson 13.- Factors affecting disease outbreaks and severity.

Lesson 14.- Fungal diseases. Chalkbrood (*Ascosphaera*). Stonebrood (*Aspergillus*)

Lesson 15.- Bacterial diseases. American foulbrood, European foulbrood. Other bacterial diseases.

Lesson 16.- Viral diseases: Paralysis virus, Sac brood virus. Other viral diseases.

Lesson 17.- Parasitic diseases: varroosis, nosemosis and acarapisosis

Lesson 18.- Colony Collapse Disorder (CCD). Other processes (biotic and abiotic) that affect bees and hives.

6. Quality control of bee products (2h)

Lesson 19.- Quality of honey. Definition. Types of honey. Bromatological composition. Components of nutritional interest. Contaminants. Toxic honeys. Quality control.

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Lesson 20.- Other products of the hive. Definition. Types of bee products. Bromatological composition. Components of nutritional interest. Contaminants. Quality control

7. Economics and marketing of apiculture/beekeeping products (2h)

Lesson 21.- Introduction to the Spanish economy concerning beekeeping sector. The economic and environmental importance of the sector. Market failure and externality concepts.

Lesson 22.- Production structures, production, demand and marketing. Censuses, agricultural holdings and regional distribution. Production costs. Economic quantity and value in the production. Consumption: differentiated products and quality schemes. Spanish and E.U. foreign trade. Market prospects.

Lesson 23.- Support systems. The strengths and weaknesses of the sector. Structural and quality support measures. National Beekeeping Plan. Future prospects of the beekeeping sector. Strategic recommendations.

8- Legislation (2h)

Lesson 24.- Current legal framework on beekeeping activity, production and bee health.

Practical training

- Laboratory training:

Practical activity 1.- Anatomy of *Apis mellifera* (brood and adult). Laboratory diagnosis of infectious and parasitic diseases (3h).

Practical activity 2. Presentation of semen collection and queen bee artificial insemination (1h).

Practical activity 3.- Melliferous flora and vegetation types identification (1h)

Practical activity 4.- Sensory evaluation of honey. Quality of honey (1h).

-Field training :

Visits to apiaries supervised (3h)

. Visit to the apiary (1,5h)

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. Melliferous flora and vegetation types identification around the beehives (1,5h)

‐ Visits to industries and businesses in the sector supervised (2h).

5.4.Planning and scheduling

Schedule sessions and presentation of works

The dates and key milestones of the subject are described in detail, (along with those of the rest of subjects of fourth year in the Degree in Veterinary Medicine), on the website of the Faculty of Veterinary Medicine (link: <http://veterinaria.unizar.es/gradoveterinaria/>). This link will be updated at the beginning of each academic year.

5.5.Bibliography and recommended resources

<http://psfunizar7.unizar.es/br13/eBuscar.php?tipo=a>