

28438 - Beekeeping: Production and Health

Información del Plan Docente

Academic Year	2017/18
Faculty / School	105 - Facultad de Veterinaria
Degree	451 - Degree in Veterinary Science
ECTS	3.0
Year	
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

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

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

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.

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

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.Syllabus

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.

Lesson10.- Phenology and Transhumances.

Lesson 11.- Ecosystem services of Beekeeping: entomophylous 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.Course planning and calendar

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

[BB: Bibliografía básica / BC: Bibliografía complementaria]

- [BB] Guía de prácticas correctas de higiene para el sector miel / coordinado or Ana Picot Castro. Zaragoza : Gobierno de Aragón,2015
- [BB] Jean-Prost, Pierre. Apicultura : conocimiento de la abeja : manejo de la colmena / Pierre Jean-Prost,con la colaboración de Paul Medori . 4ª ed., rev. y ampl., reimpr. / por Carlos de Juan de la 7ª ed. francesa rev. y ampl. por Yves le Conte Madrid [etc.] : Mundi-Prensa, 2010
- [BB] Tratado de apicultura / [director, Henri Clément ; traducción, Manuel Pijoan] . Barcelona : Omega, D. L. 2012
- [BC] Bee disease diagnosis / scientific editors M. E. Colin, B. V. Ball, M. Kilani . Zaragoza : CIHEAM, 1999
- [BC] Bianchi, E. M.. Control de calidad de la miel y la cera / por E. M. Bianchi . [reimpr.] Roma : FAO, 1993
- [BC] Fattori, Susana Beatriz. La Miel : propiedades, composición y análisis físico químico / |Susana Beatriz Fattori Argentina : Comisión Apimondia "Tecnología y Productos", 2005
- [BC] Invertebrate medicine / Gregory A. Lewbart [editor] . 2nd ed. Ames : Wiley-Blackwell, cop. 2012
- [BC] Luis-Yagüe Sánchez, José Ramón. Los enjambres : captura, control y manejo / José Ramón Luis-Yagüe Sánchez, Juan Carlos Saceda de Marcos . 2ª ed. Barcelona : Montagud, cop. 2002
- [BC] Mankiw, N. Gregory. Principios de economía / N. Gregory Mankiw ; traducción, Esther Rabasco ; revisión técnica, Gloria Moreno . 6ª ed. Madrid : Paraninfo, D.L. 2012
- [BC] Ortega Sada, José Luis. Flora de interés apícola y polinización de cultivos / José Luis Ortega Sada . Madrid : Mundi-Prensa, 1987
- [BC] Piana, Giulio. La miel : alimento de conservación natural : origen, recolección, comercialización / Giulio Piana, G. Ricciardilli D'Albore, A. Isola ; versión española de Enrique Asensio de la Sierra . [1ª ed.] Madrid : Mundi-Prensa, 1989
- [BC] Producciones cinegéticas, apícolas y otras / coordinador y director Carlos Buxadé Carbó ; con la participación de 20 autores . Madrid [etc.] : Mundi-Prensa, 1997
- [BC] Rita, Joan. Flora melífera de la provincia de Lleida / Joan Rita Larrucea . Lleida : Diputación de Lleida, 1983
- [BC] Ruttner, Friedrich. Breeding techniques and selection for breeding of the honey bee Derby, UK : British Isles Bel Breeders Association Codnor, 1988
- [BC] Schmid Hempel, Paul. Parasites in social insects /Paul Schmid-Hempel Princeton : Princeton University, 1998
- [BC] Tautz, Jürgen. Abejas : un mundo biológicamente extraordinario / Jürgen Tautz ; fotografías de Helga R. Heilmann ; traducido del alemán por Jaime Esaín Escobar . Zaragoza : Acribia, D. L. 2009
- [BC] Tautz, Jürgen.. The Buzz about Bees [Recurso electrónico] : Biology of a Superorganism / by Jürgen Tautz. . Berlin, Heidelberg : Springer-Verlag, 2008. [Para acceder al texto completo mirar URL]
- [BC] Tratado de derecho alimentario / Miguel Ángel Recuerda Girela, director . 1ª ed. Cizur Menor (Navarra) : Aranzadi, 2011

Listado de URL



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- Guía de prácticas correctas de higiene para el sector miel
[http://www.aragon.es/estaticos/GobiernoAragon/Departamentos/AgriculturaGanaderiaMedioAmbiente/TEMAS_AGRICULTURA]
- The Buzz about Bees / Jürgen Tautz
[<http://roble.unizar.es:9090/login?url=http://dx.doi.org/10.1007/978-3-540-78729-7>]