Course guide
390343 - ANA - Animal Feeding and Nutrition

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 AGRONOMIC SCIENCE ENGINEERING (Syllabus 2018). (Optional subject).
Academic year: 2022  ECTS Credits: 6.0  Languages: Catalan

LECTURER

Coordinating lecturer: Raúl Fanlo Grasa
Others: Lorenzo Álvarez del Castillo

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE-CA-20PA. (ENG) Tecnologías de la producción animal.
Anatomía animal. Fisiología animal. Sistemas de producción, protección y explotación animal. Técnicas de la producción animal.
Genética y mejora animal.

Transversal:
CT4. (ENG) Trabajo en equipo. Ser capaz de trabajar como miembro de un equipo interdisciplinar, ya sea como un miembro más o realizando tareas de dirección, con la finalidad de contribuir a desarrollar proyectos con pragmatismo y sentido de la responsabilidad, asumiendo compromisos teniendo en cuenta los recursos disponibles.

Basic:
CB2. (ENG) Que los estudiantes sepan aplicar sus conocimientos a su trabajo o vocación de una forma profesional y posean las competencias que suelen demostrarse por medio de la elaboración y defensa de argumentos y la resolución de problemas dentro de su área de estudio.

TEACHING METHODOLOGY

The hours of directed learning consist on:
- Lectures (large group); professor make an exposition with three parts: (1) introduce the learning objectives, (2) present the basic concepts (3) look for the student's involvement from questions or case presentation in order to relate the indicated concepts.

- Practical sessions (small group) related to the identification of feedstuffs and quality assessment of feeds. Different types of diets will be formulated using softwares. Students will visit a feed mill, the port of Tarragona and two different animal nutrition research centres.

- Guidance of the student in the elaboration of management plans of the animal's production. They will have to make some bibliographic search for the deliverables.

The support materials in addition to the bibliography are the lectures, practical guides, complementary readings. All will be available at ATENEA.

The bibliography will be provided during the course. This will include books available in the library and websites.

LEARNING OBJECTIVES OF THE SUBJECT

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STUDY LOAD

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<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Hours large group</td>
<td>40,0</td>
<td>26.67</td>
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<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
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<tr>
<td>Hours small group</td>
<td>20,0</td>
<td>13.33</td>
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Total learning time: 150 h

CONTENTS

**Introduction to Animal Nutrition and Feeding**

**Description:**
- Introduction
- Animal Nutrition and Feeding concepts
- Importance of livestock feeding in animal production

**Related activities:**
- Activity 1: lectures
- Activity 2: tests

**Full-or-part-time:** 2h
- Theory classes: 1h
- Self study: 1h

**Gastrointestinal anatomy and physiology**

**Description:**
Initial concepts. Digestive anatomophysiology of pigs, birds, rabbits, cows, sheep and goats.

**Related activities:**
- Activity 1: lectures
- Activity 2: tests

**Full-or-part-time:** 10h 30m
- Theory classes: 3h
- Self study: 7h 30m
### Feedstuffs

**Description:**
The foods, grouped by their taxonomies and their relationship with the contents in energy, protein and fats, and inclusion levels are presented. Main producing countries and their links with geopolitics and history. Grass and forage crops, silage and hay, fodder dehydrated, straw, roots, tubers and by-products. Cereals and by-products. Protein concentrates, oils and fats and additives.

**Related activities:**
- Activity 1: lectures
- Activity 2: tests
- Activity 3: lab sessions
- Activity 4: feedstuff deliverable

**Full-or-part-time:** 17h
- Theory classes: 4h
- Laboratory classes: 3h
- Self study: 10h

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### Feed manufacturing technology

**Description:**

**Related activities:**
- Activity 1: lectures
- Activity 2: tests
- Activity 4: feed manufacturing deliverable

**Full-or-part-time:** 10h 30m
- Theory classes: 3h
- Self study: 7h 30m

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### Feed assessment

**Description:**

**Related activities:**
- Activity 1: lectures
- Activity 2: tests
- Activity 3: lab sessions
- Activity 4: feed assessment deliverable

**Full-or-part-time:** 41h
- Theory classes: 12h
- Laboratory classes: 2h
- Self study: 27h
Feed formulation

Description:

Related activities:
Activity 1: lectures
Activity 2: tests
Activity 5: practicum
Activity 6: feed formulation deliverables

Full-or-part-time: 17h
Theory classes: 1h
Practical classes: 4h
Self study : 12h

Nutritional requirements

Description:
For both monogastric and ruminants, the nutritional requirements in energy, protein, vitamins and minerals are calculated depending on their physiological condition and system used (i.e., INRA, NRC, ARC) at maintenance, growth, reproduction or egg laying, gestation and lactation. Nutritional deficiencies.

Related activities:
Activity 1: lectures
Activity 2: tests

Full-or-part-time: 36h
Theory classes: 12h
Self study : 24h

Animal behaviour and welfare

Description:
Brief introduction to animal behaviour and welfare

Full-or-part-time: 4h
Theory classes: 2h
Self study : 2h

ACTIVITIES

Activity 1: lectures

Full-or-part-time: 76h
Theory classes: 38h
Self study: 38h
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<tr>
<th>Activity 2: tests</th>
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<tr>
<td><strong>Material:</strong> Tests</td>
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<tr>
<td><strong>Full-or-part-time:</strong> 2h</td>
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<td>Theory classes: 2h</td>
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<th>Activity 3: Lab sessions</th>
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<td><strong>Description:</strong> Microscopy and physical quality assessment of feeds.</td>
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<td><strong>Full-or-part-time:</strong> 7h</td>
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<td>Practical classes: 5h</td>
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<td>Self study: 2h</td>
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<th>Activity 4: deliverables</th>
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<td><strong>Full-or-part-time:</strong> 15h</td>
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<td>Self study: 15h</td>
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<th>Activity 5: Field visits</th>
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<td><strong>Description:</strong> Students will visit experimental monogastric and ruminant farms as well as the port of Tarragona and a feed mill.</td>
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<td><strong>Full-or-part-time:</strong> 13h</td>
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<td>Guided activities: 10h</td>
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<td>Self study: 3h</td>
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<th>Activity 6: IT sessions</th>
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<td><strong>Description:</strong> To formulate diets suitable for different species and productive stages.</td>
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<td><strong>Specific objectives:</strong></td>
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<td><strong>Material:</strong> Class material, bibliography, websites and rationing software.</td>
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<td><strong>Full-or-part-time:</strong> 24h</td>
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<td>Laboratory classes: 4h</td>
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<td>Self study: 20h</td>
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**GRADING SYSTEM**
BIBLIOGRAPHY

Basic:

RESOURCES

Hyperlink:
- FEDNA (Fundación Española para el Desarrollo de la Nutrición Animal). x