

## Course guide

### 390343 - ANA - Animal Feeding and Nutrition

Last modified: 06/06/2023

**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:** 2023    **ECTS Credits:** 6.0    **Languages:** Catalan

#### LECTURER

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**Coordinating lecturer:** Raúl Fanlo Grasa

**Others:** Lorenzo Álvarez del Castillo

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**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

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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

Type	Hours	Percentage
Hours large group	40,0	26.67
Self study	90,0	60.00
Hours small group	20,0	13.33

**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

### Feed manufacturing technology

**Description:**

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**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

### Feed assessment

**Description:**

Methodologies for the feed assessment. Physical, chemical, physiological, energetic value and protein assessment. Voluntary feed intake.

**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:**

General concepts. Algebraic methods for manual formulation. Formulation softwares.

**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



#### Activity 2: tests

**Material:**

Tests

**Full-or-part-time:** 2h

Theory classes: 2h

#### Activity 3: Lab sessions

**Description:**

Microscopy and physical quality assessment of feeds.

**Full-or-part-time:** 7h

Practical classes: 5h

Self study: 2h

#### Activity 4: deliverables

**Full-or-part-time:** 15h

Self study: 15h

#### Activity 5: Field visits

**Description:**

Students will visit experimental monogastric and ruminant farms as well as the port of Tarragona and a feed mill.

**Full-or-part-time:** 13h

Guided activities: 10h

Self study: 3h

#### Activity 6: IT sessions

**Description:**

To formulate diets suitable for different species and productive stages.

**Specific objectives:**

**Material:**

Class material, bibliography, websites and rationing software.

**Full-or-part-time:** 24h

Laboratory classes: 4h

Self study: 20h

## GRADING SYSTEM



## BIBLIOGRAPHY

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### Basic:

- Pond, Wilson G. Basic animal nutrition and feeding. 5th ed. Hoboken, NJ: Wiley, cop. 2005. ISBN 0471215392.
- McDonald, P. Animal nutrition. 6th ed. Harlow [etc.]: Pearson Education, 2002. ISBN 0582419069.

## RESOURCES

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### Hyperlink:

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