

28418 - Quantitative Genetics: Molecular Genetics and Improvement

Información del Plan Docente

Academic Year	2017/18
Faculty / School	105 - Facultad de Veterinaria
Degree	451 - Degree in Veterinary Science
ECTS	6.0
Year	2
Semester	Second semester
Subject Type	Compulsory
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

5.2.Learning tasks

The program includes the following activities (each unit involves two theoretical teaching sessions)

1. Theoretical lectures. In 30 sessions of 1 hour, to develop key concepts.

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2. Problems. In 12 sessions of 1 hour, raised to solve theoretical situations.

3. Practices. 8 sessions of two hours in computer classroom supported with simulation programs freely available.

4. Seminars. In 2-hour sessions to analyze and discuss with professor different proposed situations.

Practices and seminars will be devoted to treat more than 40 modules developed PQGen Software freely available for this purpose with current issues in animal breeding.

The resolution of proposed cases is a non-presential activity for the student.

5.3.Syllabus

BLOCK 1. INTRODUCTION

Unit 1. An approach to animal breeding. Objectives and selection criteria.

Unit 2. Organization of genetic improvement. Associations and companies.

BLOCK 2. Genetic structure of a quantitative trait

Unit 3. Values, means and variances.

Unit 4. Numerator kinship, relationship between relatives, heritability and repeatability.

BLOCK 3. SELECTION

Unit 5. Components of the response to selection.

Unit 6. Selection indexes.

Unit 7. Correlated response.

BLOCK 4. COMBINATION ABILITY AND CROSSING

Unit 8. Inbreeding depression and crossing.

Topic 9. Selection for combining ability.

BLOCK 5. SELECTION FOR GENES AND MARKERS

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Topic 10. Linkage disequilibrium and marker-assisted selection.

Unit 11. Genomic selection.

BLOCK 6. INHERITANCE OF DISEASES IN DOMESTIC ANIMALS

Unit 12. Hereditary diseases associated with single copy genes and a multigenic inheritance.

Topic 13. Control and eradication of hereditary diseases.

BLOCK 7. HANDLING CHANGES OF GENOME IN ANIMAL BREEDING

Topic 14. Transgenesis as a tool in Veterinary sciences.

Topic 15. Therapies based on the genetic modification and its applications in animal breeding.

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 other subjects of the degree of Veterinary, on the website of the Faculty of Veterinary (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] Falconer, D. S.. Introducción a la genética cuantitativa / D. S. Falconer, Trudy F. C. Mackay ; [traducción realizada por Armando Caballero Rúa... (et al.)] . 1a. ed. en español, traducción de la 4a. ed. inglesa, 1a. reimp. Zaragoza : Acribia, 2006
- [BB] Genética moderna / Anthony J. F. Griffiths [et al.] ; [traducción, Francisco J. Murillo Araujo... (et. al.) ; revisión técnica, Francisco J. Murillo Araujo] . [1ª ed. en español, reimpr.] Madrid [etc.] : Mc Graw-Hill Interamericana, D.L. 2004
- [BB] Klug, William S.. Conceptos de genética / William S. Klug, Michael R. Cummings, Charlotte A. Spencer ; traducción y revisión técnica, José Luis Ménsua, David Bueno i Torrens . 8ª ed. Madrid [etc.] : Pearson, cop. 2006
- [BB] Nicholas, F.W.. Introducción a la genética veterinaria / F.W. Nicholas ; [traducción a cargo de Alfredo Ruiz Panadero, Arcadio Navarro Cuartiellas, Esther Beltrán Paula] . Zaragoza : Acribia, 1998

Listado de URL

- American Society of Gene and Cell Therapy [<http://www.asgct.org/>]
- European Society of Gene & Cell Therapy [<http://www.esgct.eu/>]
- Jackson Laboratory [<http://www.jax.org/>]
- NCBI [<http://www.pubmed.org/>]
- Online Mendelian Inheritance in Animals [<http://omia.angis.org.au/>]
- Programa de Genética de Poblaciones y Genética Cuantitativa [<http://sites.google.com/a/unizar.es/pqgen/>]
- Transgénesis mamíferos [<http://www.cnb.uam.es/~transimp/>]