

Code: 1430 Animal Breeding**Degree:** 2nd cycle – Animal Production Engineering**Curricular Year:** 1st**Semester Course:** 1st**Credits:** 6 ECTS**Compulsory****Language:** Portuguese/English**Responsible:** Luís Lavadinho Telo da Gama (FMV)**Other lecturer(s):** Vítor Manuel Alves (FMV)**Web Site:** <http://www.isa.utl.pt/home/node/3853>**1. Contact hours:****Lecture/Practicals 70 Others 14 Total 84****2. Objectives:**

Knowledge of the applications of population, quantitative and molecular genetics to the improvement and conservation of Animal Genetic Resources; Evaluation of the impact of different mating systems (inbreeding and crossbreeding) in animal production; Development of methods of genetic evaluation and prediction of expected response to selection; Planning of organized breeding schemes for different livestock species.

3. Programme:

- 1) Animal Genetic Resources: characterization, conservation and management of Animal Genetic Resources.
- 2) Population genetics: gene and genotypic frequencies; types of gene action; Hardy-Weinberg law. Factors affecting gene and genotypic frequencies. Single genes of importance in animal breeding.
- 3) Mating systems
 - Inbreeding: inbreeding in an individual and in a population; relationships and genetic contributions; inbreeding and selection; management of genetic variability.
 - Crossbreeding: Individual and maternal heterosis. Breed direct and maternal effects; major types of crosses; expected results.
- 4) Selection: Review of basic statistical principles. True and estimated breeding value. Heritability. Expected and observed response to selection. Estimation of genetic parameters. Correlated responses to selection. Genetic evaluation and expected response to selection with repeated records, and records on progeny, ancestors or collateral relatives. Selection index. BLUP. Selection for several traits. Expected responses in more complex systems.
- 5) Genotype*environment interaction
- 6) Applications of biotechnologies in animal breeding: reproductive technologies; genetic polymorphisms; cloning; transgenesis.
- 7) Selection programs in different livestock species: organized selection schemes. Organization of genetic improvement. Selection programs in different species.

4. Bibliography:**Main Bibliography**

Gama, L.T. 2002. Melhoramento Genético Animal. Escolar Editora, Lisboa.

Other Bibliography

Bourdon, R.M. 1997. Understanding Animal Breeding. Prentice Hall, New Jersey.

Chapman, A.B. (Ed.). 1985. General and Quantitative Genetics. Elsevier Science, Amsterdam

Minvielle, F. 1990. Principes d'Amélioration Génétique des Animaux Domestiques. INRA Editions, Paris.

Nicholas, F.W. 1996. Introduction to Veterinary Genetics. Oxford University Press, Oxford.

Van Vleck, L.D., E.J. Pollak and E.A.B. Oltenacu. 1987. Genetics for the Animal Sciences. W.H.

Freeman and Co., New York.

5. Assessment:

Written exam, including theoretical and practical subjects, at the end of semester.

6. Estimated Workload:

168	Hours
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7. Last Update:

14/7/2010
