Principles of Animal Breeding [16]

COURSE OUTLINE

(1) GENERAL

SCHOOL	ANIMAL BIOSCIENCES		
ACADEMIC UNIT	DEPARTMENT OF ANIMAL SCIENCE		
LEVEL OF STUDIES	Undergraduate [Required]		
COURSE CODE	**16**	**SEMESTER**	**7th**
COURSE TITLE	PRINCIPLES OF ANIMAL BREEDING		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Theory	3	3
Laboratory Practicals	2	2
TOTAL	**5**	**5**
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialized general knowledge
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS:	YES
COURSE WEBSITE (URL):	THEORY: https://oeclass.aua.gr/eclass/courses/730/ PRACTICAL: https://oeclass.aua.gr/eclass/courses/EZPY101/
TEACHING STAFF:	ANTONIOS KOMINAKIS, PANAGIOTA KOUTSOULI, ARIADNI LOUKIA HAGER

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon successful completion of the course, students will be able (according to Bloom) to:

- Describe and explain that livestock populations (breeds, herds, etc.) form gene (allele) pools, and define their genetic makeup using terms such as allelic and genotypic frequencies, including the application of Population Genetics laws such as Hardy-Weinberg equilibrium (**Knowledge / Comprehension**).
- Analyze and evaluate genetic diversity in populations using measures such as expected and observed heterozygosity (**Analysis / Evaluation**).
- Explain how genetic constitution of livestock populations can change due to forces causing departure from genetic equilibrium, including migration, natural and artificial selection, genetic drift, mutation, and mating systems (**Knowledge / Comprehension / Analysis**).
- Describe the mode of inheritance of quantitative traits (QNT) in livestock populations, including genetic polymorphisms, lethal genes, genes associated with genetic disorders, and major genes such as the Booroola gene (**Knowledge / Comprehension**).
- Analyze the inheritance patterns of quantitative traits (QLT), including additive, dominance, epistasis, and pleiotropy effects, as well as the influence of systematic environmental effects on phenotypic values for production and reproduction traits (**Analysis / Evaluation**).
- Explain the concept, methods of estimation, and importance of heritability in both broad and narrow sense (**Knowledge / Comprehension / Application**).

- Describe the concept, methods of estimation, and importance of repeatability in livestock traits (**Knowledge / Comprehension / Application**).
- Explain and calculate genetic, environmental, and phenotypic correlations, and interpret their significance in livestock breeding (**Knowledge / Comprehension / Application / Analysis**).

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	.....
Production of new research ideas	*Others...*
	.....

- The 13 practical combine individual and group working ability.
- Individual and group assignments are aimed at enhancing students' skills development associated with ability to search, combine and present scientific information mined from references and the internet.

Group assignments are presented in class and are followed by detailed analysis and discussion aiming to development of students' critical thinking

(3) SYLLABUS

- Population Genetics: principle of Hardy-Weinberg Equilibrium (HWE). Properties of populations under HWE. Factors causing departure from HWE (selection, mutation, migration, genetic drift).
- Qualitative and Quantitative Traits. Mode of inheritance and typical examples per trait group.
- Quantitative Genetics: phenotypic value, genotypic values, breeding value, covariance between relatives, additive allelic effects, dominance deviation, degree of dominance, pleiotropy, broad and narrow sense heritability, repeatability, genetic and phenotypic correlation.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY
Face-to-face, Distance learning, etc.

Face to Face

USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students

Use of ICT in teaching during practicals and communication with students

TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS

Activity	***Semester workload***
lectures	36
Practicals in class groups	26
Group assignments (max 4 students)	15
Individual assignments	10
Individual study	38
Course total (25 h of workload per ECTS)	***125***

STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation,

Evaluation is performed in Greek language (in English for Erasmus students).
The final theory grade is a weighted average of group assignment scores (25%) and final written exam scores (75%). The written exam is in form of multiple-choice questions.
The final practicals grade is a weighted average of individual assignment scores (10%) and progress exams scores (90%) or 100% final written exams scores

laboratory work, clinical examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students*.	

(5) ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*
E. Rogdakis, 2006: Animal Breeding, Stamoulis, Edts.
Banos, G, 2010. Basic Principles of Genetics and Heredity.
Bourdon R. M. (2000): Understanding Animal Breeding (second edition), Prentice Hall.

- *Related academic journals:*
Journal of Animal Breeding & Genetics
Journal of Animal Science
Journal of Dairy Science
Journal of Applied Genetics