COURSE LAYOUT

1. GENERAL

SCHOOL	Animal Biosciences		
DEPARTMENT	Animal Science		
STUDY LEVEL	*Undergraduate*		
COURSE CODE	16	**SEMESTER**	3rd
COURSE TITLE	Principles of Animal Breeding		

INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	ECTS
Theory	3	
Laboratory Practicals	2	5

COURSE TYPE (Foundation course, General knowledge, Scientific area, Developing skills)	**Scientific area**
PREREQUISITES	
LANGUAGE	Greek
IS THE COURSE OFFERED for ERASMUS STUDENTS?	Yes
COURSE WEB PAGE	https://mediasrv.aua.gr/eclass/courses/EZPY101/

2. LEARNING OUTCOMES

Learning Outcomes

This is an introductory course in the field of Animal Breeding. After course completion, the student is expected to have learned:

- That livestock populations (breeds, herds etc) are forming gene (alleles) pools. The genetic makeup of these populations can be described via suitable terms (e.g. allelic and genotypic frequencies) and is subjected to laws of Population Genetics such as the principle (law) of Hardy-Weinberg (Genetic Equilibrium). Of major importance for a population is genetic diversity that can be described with help of various measures (e.g. expected and observed heterozygozity etc).
- That genetic constitution of livestock populations can also change as a result of various forces causing departure from genetic equilibrium (e.g. migration, natural and artificial selection, genetic drift, mutation, mating system etc).
- On the mode of inheritance of Quantitative Traits (QNT) in livestock populations. Among others, QNT comprise genetic polymorphisms (e.g. microsatellites, SNPs etc), lethal genes and/or genes associated with genetic disorders as well as major genes (e.g. Booroola gene).
- On the mode of inheritance of Quantitative Traits (QLT), the mode of action (additive, dominance, epistasis and pleiotropy) as well as the importance of systematic environmental effects in determining the phenotypic values of various production and reproduction traits.
- The concept, methods of estimation and importance of heritability (broad and narrow sense).
- The concept, methods of estimation and importance of repeatability.
- The concept, methods of estimation and importance of genetic, environmental and phenotypic correlation.

General Competences

- The 13 practicals combine individual and group working ability.
- Individual and group assignments are aimed to enhance 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. COURSE CONTENT

- 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

TEACHING METHOD	in person Class teaching
USE OF INFORMATICS and COMMUNICATION TECHNOLOGIES	Use of e-class tools during practicals and communication with students

TEACHING ORGANISATION (Lectures, individual or group assignments, field trips, individual study et.c.)	*Activities*	*Workload per semester*
	lectures	36
	Practicals in class groups	26
	Group assignments (max 4 students)	15
	Individual assignments	10
	Individual study	38
	Total contact hours and training	***125***

STUDENTS EVALUATION	
	• Evaluation is performed in Greek language.
	• The final theory grade is a weighted average of group assignment scores (25%) and final written exam scores (75%). 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.

5. 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.
-*Journals:*
- Journal of Animal Breeding & Genetics
- Journal of Animal Science
- Journal of Dairy Science
- Journal of Applied Genetics