



# UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Agrarie, Alimentari e Forestali		
ACADEMIC YEAR	2022/2023		
MASTER'S DEGREE (MSC)	AGROENGINEERING AND FORESTRY SCIENCES AND TECHNOLOGIES		
SUBJECT	CONSERVATION AND GENETIC MANAGEMENT OF ZOOTECHNICAL BIODIVERSITY		
TYPE OF EDUCATIONAL ACTIVITY	B		
AMBIT	50564-Discipline forestali ed ambientali		
CODE	20928		
SCIENTIFIC SECTOR(S)	AGR/17		
HEAD PROFESSOR(S)	SARDINA MARIA TERESA	Professore Associato	Univ. di PALERMO
OTHER PROFESSOR(S)			
CREDITS	6		
INDIVIDUAL STUDY (Hrs)	88		
COURSE ACTIVITY (Hrs)	62		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<b>SARDINA MARIA TERESA</b> Friday      10:00    13:00    Edificio 4, Ingresso G, Stanza PT-68		

**DOCENTE:** Prof.ssa MARIA TERESA SARDINA

<b>PREREQUISITES</b>	Knowledges about animal husbandry and animal productions. Knowledges about Mendelian genetics, inheritance and variations. Knowledges on structure and function of nucleic acids. Knowledges on the most important genetic molecular markers.
<b>LEARNING OUTCOMES</b>	Knowledge and understanding: the student must be able to revise studied topics in order to present and expose knowledges in appropriate and unique communication skills. Applying knowledge and understanding: the student must be able to apply in a practical way the knowledges in several different contexts. Making judgements: the student must be able to independently investigate what has studied and to use basic knowledges as starting point for further results characterized by greater intellectual growing and judgment. Communication skills: the student must be able to transfer to others, in clear and precise way, the knowledges and must be fully understandable by listeners which do not study that course and do not have specific knowledges. Learning skills: despite the lectures are a very important teaching aid, the student must gradually become independent and acquire the ability to increase knowledges through a training course shared with other students but characterized by intellectual and independent growing.
<b>ASSESSMENT METHODS</b>	Learning will be evaluated with oral exam which consists in an interview for evaluating acquired knowledges, communication skills and properties of language. The evaluation (minimum grade is 18 and maximum is 30 cum laude) is stated using the following scheme: 1) Knowledge of the topics, capability to apply the learned knowledge, capability to analyse the studied problem, ability to present the topic is judged sufficient (18-21) 2) Knowledge of the topics, capability to apply the learned knowledge, capability to analyse the studied problem, ability to present the topic is judged fair (22-25) 3) Knowledge of the topics, capability to apply the learned knowledge, capability to analyse the studied problem, ability to present the topic is judged good-high (26-28) 4) Knowledge of the topics, capability to apply the learned knowledge, capability to analyse the studied problem, ability to present the topic is judged high advanced (29-30 cum laude)
<b>EDUCATIONAL OBJECTIVES</b>	.The objective of the discipline is to provide knowledges on the importance of conservation of genetic diversity in different livestock species, on the management of autochthonous livestock breeds with limited diffusion (small populations), on the conservation programs for livestock biodiversity, and on the valorisation of livestock productions and their authentication.
<b>TEACHING METHODS</b>	The course consists of lectures, practical exercises in the classroom and in the laboratory. The lectures aimed to provide students with knowledges on the importance of livestock genetic diversity for conservation and management programs; on the conservation programs of autochthonous livestock biodiversity, on the valorisation of livestock productions and their authentication; on the management of small populations and especially of those at risk of extinction. The practical exercises will be carried out to better understand the importance of estimating of genetic diversity indices within and between populations in order to choose appropriate conservation programs. The laboratory exercises aimed to understand the modern molecular biotechnologies in support of conservation plans and conservation of livestock biodiversity.
<b>SUGGESTED BIBLIOGRAPHY</b>	TESTO di RIFERIMENTO: G. Pagnacco - GENETICA ANIMALE Applicazioni Zootecniche e Veterinarie (Terza Edizione) - 2020 - Casa Editrice Ambrosiana - ISBN: 880852017X LETTURE DI APPROFONDIMENTO: K. Oldenbroek – UTILISATION AND CONSERVAZIONE OF FARM ANIMAL GENETIC RESOURCES - 2007 - Wageningen Academic Publishers; FAO, 2013 - In vivo conservation of animal genetic resources. FAO - Animal Production and Health Guidelines. No. 14. Rome Materiale bibliografico fornito dal docente.

## SYLLABUS

Hrs	Frontal teaching
6	The genetic management of small populations. Introduction on the most important cosmopolitan and autochthonous breeds from bovine, ovine and caprine species. Diffusion and productive characteristics
4	Breeds standardization and use of coat colour genes in genetic traceability of products.
4	Population genetics: allele and genotypic frequencies. Hardy-Weinberg equilibrium. Application to different case studies.
2	The genetic of quantitative traits. The genetic model. Examples of different production quantitative traits
6	Quantitative trait loci (QTL) and major genes and their use for genomic selection. Linkage disequilibrium between and among loci. Molecular biotechnologies for livestock research.

## SYLLABUS

Hrs	Frontal teaching
4	Estimation of relationship and inbreeding among individuals. Inbreeding, linebreeding, and heterosis. Estimation of inbreeding within population and control strategies
6	Genetic diversity indexes. Genetic variability within and among breeds. Genetic distance among breeds. Genomic linkage disequilibrium
10	Conservation, safeguard and valorization of breeds/populations with limited diffusion: presentation of different case studies
Hrs	Practice
3	Assignment test of individuals to their breed/population of origin. Identity, paternity, and maternity tests.
3	Molecular markers for genetic traceability of livestock typical products
3	High-throughput molecular biotechnologies for genomic selection
3	Genomic application of molecular markers and high-throughput biotechnologies for conservation of livestock biodiversity.
3	High-throughput genomic data and their use in genetic characterization and conservation
2	Population genetics: allele and genotypic frequencies. Hardy-Weinberg equilibrium. Application to different casein genes
3	Use of genomic data and graphic representation of genetic distance and genetic variability within and among breeds.