

ACCADEMIC YEAR 2023/2024

General Information	
Integrated Course Name	ANIMAL PRODUCTIONS 2
Integrated didactic modules	Livestock technologies and hygiene; Poultry And Rabbit Farming; Animal breeding and selection.
Degree Cours	Veterinary Medicine
Academic year	IV
SSD	AGR/19, AGR/20, AGR/17
language	Italian
Academic calendar (starting and ending date)	III bimester
Mandatory	yes

Professor/Lecturer	mail	phone
Pasquale De Palo	pasquale.depalo@uniba.it	0805443983
Gerardo Centoducati	gerardo.centoducati@uniba.it	0805443983
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Headquarter	Campus of Veterinary Medicine, S.P. 62 per Casamassima km 3, 70010 Valenzano
Virtual headquarter	Teams App
Tutoring (time and day)	Monday 10.30am-12.30pm Thursday 2pm-5pm It is recommended to book tutoring sessions sending an email

Syllabus	
Learning objectives	The integrated course of animal production 2 aims to transfer to the student the knowledge, skills and abilities relating to animal husbandry and genetic improvement, with particular reference to the breeding technologies of different species, to the knowledge of the principles of animal science biosecurity. The student will have to acquire managerial and decision-making skills, starting from a correct approach to the management of animals on the farm, up to an integrated rationale to make improvements and adequate solutions aiming to respect and improve animal welfare standards and productivity.
Course prerequisites	The prerequisite of the "Animal Production 1" exam is required. The student must know the veterinary anatomy, physiology and endocrinology of the farm animals, particularly, digestive, reproductive, galactopoietic and body growth systems and functions. The student must know the principles behind the Mendelian genetics and the population genetics. The student must know the basic principles of breeding and evaluation of morphological and functional evaluation of farm animals, as well as nutrition and feeding of animals.

<p>Contents: Animal Science Technology and Hygiene Professor: Pasquale DE PALO</p> <p>Frontal teaching CFU: 5</p> <p>Hours: 65</p> <p>In field activities CFU: 1 Hours: 25</p>	<ul style="list-style-type: none"> - Dairy cattle (1 CFU): management of reproduction. Colostrum, milk replacers, natural suckling. Calf and heifer management. Breeding techniques for lactating, transition, dry off and close-up cows. Functional hoof trimming. Influence of farm management on productive and reproductive parameters. Stables, equipment and milking parlours. Technical characteristics of Automatic milking systems. Sensors and software applied for animal welfare and management. - Beef cattle and buffaloes (1 CFU): Meat production bovine categories: veal calf, baby beef, barley beef, beef: breeding techniques, performances, meat quality. Cow-veal and heifer-veal line. Buffalo: buffalo calf management, heifer and heifer management, lactation management. Heat synchronization and induction. Production of milk and meat. Principles of Farm Hygiene: water, food, animal transport, hygiene of livestock facilities. Waste management. Bovine hoof and udder hygiene - Sheep and goats (1 CFU): management of reproduction. Colostrum, milk replacers and natural suckling. Feeding of lambs and kids, weaning. Breeding techniques for lambs and ewe lambs. Breeding techniques for dry and lactating ewes and does. Sheepfolds and milking parlors. Management of pasture and feed integration of pasture. Breeding techniques for the production of meat: suckling lamb, kid, heavy lamb, mutton. - Pigs (1 CFU): systems of pig farming and their structural and functional organization. reproduction management. Colostrum management, litters fostering suckling and weaning of piglets. Breeding techniques for young boars and gilts. Fattening techniques and commercial categories of pigs. Pig farm structures and equipment. Innovative management models: pig flow farming. - Equids (1 CFU): management of reproduction. From birth to weaning of the foal. Horse breeding techniques for meat production. Horse and donkey breeding techniques for milk production. Training and breeding techniques for sport horses (trot, gallop, show jumping, dressage, American riding, endurance). Techniques of functional trimming and shoeing. Equids facilities - In-field training (1 CFU): these activities will be carried out in the second half of the course. Each lasts a whole day and they will be planned according to farms availability - Training in a bovine farm - Training in a sheep / goat farm -Training in a pig farm
<p>Contents: Zooculture Professor: Gerardo Centoducati</p> <p>Frontal teaching CFU: 2 Hours: 26</p> <p>In field activities</p>	<p>Introduction. Livestock farming in Italy and Puglia. The breeding of rabbits, principles and techniques. The importance of aviculture. Background. Situation of poultry farming in the world, in Europe and in Italy. Origin and races. Types of farming. The shelters and equipment. Egg production. Egg incubation. The moult. Meat production. Breeding techniques. Economics and management of production plants. Organic poultry production. Introduction to aquaculture. Principles and techniques.</p>



<p>CFU: 1</p> <p>Hours: 25</p>	<p>In-field training (1 CFU): these activities will be carried out in the second half of the course. It will concern: activities in a pilot fish plant system in Dept. of Veterinary Medicine and in visiting poultry farms.</p>
<p>Contents:</p> <p>Professor: Elena Ciani</p> <p>Frontal teaching CFU: 2</p> <p>Hours: 26</p>	<p>General concepts</p> <ul style="list-style-type: none"> ● Limits of Mendelian genetics ● Population genetics and genetic improvement ● Kinship and inbreeding ● Crossbreeding and heterosis ● Conservation of genetic diversity <p>Traditional breeding</p> <ul style="list-style-type: none"> ● Introduction to quantitative characters <ul style="list-style-type: none"> ○ The infinitesimal model ○ Heritability and repeatability of quantitative traits ○ Correlations between quantitative traits ● Genetic evaluation <ul style="list-style-type: none"> ○ Operational schemes and organizational methods ○ Estimation of the breeding value ○ Genetic indices ○ Estimation of the selection response <p>Genetic improvement assisted by genetic and genomic markers</p> <ul style="list-style-type: none"> ● Introduction to genetic markers <ul style="list-style-type: none"> ○ Types and attributes ○ Genotyping methods ● Approaches to search for the association between genotype and phenotype <ul style="list-style-type: none"> ○ Analysis within pedigree ○ Within-population analysis ● The use of genetic information in selection <ul style="list-style-type: none"> ○ Selection assisted by genetic markers ○ Genomic selection ○ Introgression assisted by genetic markers

<p>Biosecurity standards for the frequency of practical activities</p>	<p>Access to practical activities in the laboratories and stables is allowed only to students equipped with protective clothing (gowns and disposable latex gloves, safety boots), who have read the biosecurity manual.</p>
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<p>Personal study material</p>	
<p>Books and bibliography</p>	<ul style="list-style-type: none"> - SANDRUCCI A.: Trevisi E. Produzioni Animali, EdiSES Università, Napoli, 2022 - MONETTI P.G.: Allevamento dei suini e dei bovini. Giraldi Ed., Perugia 2001 - PARIGI BINI R., SOMEDA DE MARCO A.: Zootecnica Speciale dei Bovini. Produzione della carne. Patton Ed., Bologna, 1989 - SUCCI G., HOFFMANN I.: La vacca da latte. Città Studi Ed., Milano, 1993 - SUCCI G.: Zootecnica speciale. Città Studi Ed., Milano, 1995 - LEWIS L.D.: Alimentazione e allevamento del cavallo. F. Valfrè Ed., EMSI (1998) - PAGNACCO G., Genetica animale – applicazioni zootecniche e veterinarie. II edizione, Casa Editrice Ambrosiana.

	- CEROLINIS., MARZONI FECIA DI COSSATO M, ROMBOLI I.,: “Avicoltura e Coniglicoltura” Ed. Le Point Vétérinaire Italie – 2015 (II edizione).
Additional materials	The books are recommended for further study and integration. Given the compulsory attendance, the lecture notes/minutes and the material provided by the lecturer during the course will be of fundamental importance.

Work schedule			
Hours			
Total	Frontal teaching	practice (laboratory, in field activities, other)	Individual study
275	105	30	140
CFU/ETCS			
11	9	2	/

Teaching methods	<p>Teaching will mainly consist of frontal lessons which will be accompanied by active learning methods, such as problem solving, case study and role play, in order to integrate information and facilitate learning. The entire teaching process will be implemented through iconic, verbal and graphic communication models, making use of the resources and educational technologies available. Self Learning activities will be provided through the use of audiovisuals and films and self-assessment tests provided by teachers.</p> <p>The role of the frontal lesson will be significantly reduced, however, in the hours of practice during which greater weight will be given to problem solving and learning by doing to encourage the acquisition of skills and competences.</p> <p>The practical lessons will be held in the laboratories of the animal science section and in the affiliated farms. Students divided into groups of 8-10 people, followed and guided by the teacher and collaborators, participate in farm visits, management of individual and herd animal science cases, take and process biological samples, both individually and in groups, and then will discuss with the teacher the results obtained.</p>

Expected learning outcomes	
Knowledge and understanding	<p>In line with the Day One Competences adopted by the ECCVT, and point 2.4, the student must</p> <ul style="list-style-type: none"> - know the various breeding techniques for each species and category of zootechnical interest - know the production standards and the effects on animal welfare - know the critical points of each type of farm and the possible corrective actions - know the indicators of technopathy - possess theoretical knowledge and appropriate terminology relating to the conceptual models underlying traditional and modern breeding practices (DOC 1.4, 1.8, 1.15). - know the organizational schemes and the main institutional figures involved in the process of genetic improvement in domestic animal species (DOC 1.4, 1.6, 1.12). - possess critical knowledge about the short- and long-term implications deriving from the different genetic improvement practices (DOC 1.1). - possess basic skills for the critical evaluation of the different schemes and approaches of genetic improvement and genetic prophylaxis and for the interpretation and critical evaluation of information relating to the genetic merit of breeding animals (DOC 1.8., 1.10, 1.36) - possess the ability of identifying the best operational choices for genetic improvement in the different situations of operational practice and to interact



	effectively with the different figures involved in the genetic improvement process (DOC 1.4, 1.11, 1.12, 1.36)
Applied knowledge and understanding	<p>At the end of the course, the student must be able to have</p> <ul style="list-style-type: none"> - ability to evaluate the quality of management of the various farms, identifying strengths and margins for improvement - ability to be able to recommend improvement actions to company management, also indicating methods, times and expected results. <p>In line with the Day One Competences adopted by the ECCVT, the student must:</p> <ul style="list-style-type: none"> - understand the ethical and legal responsibilities of the farm vet (1.1) - obtain an accurate history of farming and animals raised (1.15) - assess the physical conditions, well-being and nutritional status of a group of animals and advise the client on management and feeding (1.20) - apply the principles of biosecurity on farms (1.28) - provide advice and implement appropriate preventive programs by species, category and type of farm based on animal health and welfare standards (1.36) - possess applied knowledge on ethical and legal procedures and responsibilities related to the collection of biological material for molecular investigations and the use of "omic" biotechnologies (DOC 1.1, 1.21) - understand the applicative impact of genetic improvement on traditional and innovative traits (e.g. resilience, adaptability and economic and environmental sustainability), on the conservation of biodiversity of zootechnical ecosystems and on the health of domestic animals (DOC 1.1, 1.10, 1.36) - possess the ability to consult the literature, the main scientific sites and databases, in order to provide qualified and updated advice on the subjects of genetic improvement and genetic prophylaxis (DOC 1.8, 1.20)
Soft skills	<p>Autonomy of judgment</p> <ul style="list-style-type: none"> - Ability to collect information directly from the farm, from the breeder and from the data in its possession to formulate an opinion on company management - Ability to analyze company outputs to identify corrective / improvement actions - Competence in indicating the most appropriate solutions for genetic improvement in different animal species and according to the different selective objectives, demonstrating logical reasoning skills, critical skills and general overview ability. <p>Communication skills</p> <ul style="list-style-type: none"> - Specific communication skills both with breeders and with specialized technical consultants - ability to communicate, using the appropriate terminology, and to interact with their peers and within the scientific community, as well as with the animals' herders and owners and the various institutions, at different territorial levels, which deal with conservation, management and genetic improvement of animal germplasm. <p>Ability to learn independently</p> <ul style="list-style-type: none"> - At the end of the course, the student must be able to find specialist information through bibliographic research or through contacts with public and private entities

	<ul style="list-style-type: none"> - Ability to understand, and critically acquire, more specific and constantly updated knowledge on the issues of conservation, management and genetic improvement of animal germplasm.
<p>Summary of the knowledge and skills that the integrated course helps students acquire (Day One Competence) provided by the EAEVE</p>	<p>Knowledge:</p> <p>2.2 Research methods, the contribution of basic and applied research to veterinary science and implementation of 3Rs (Replacement, Reduction, Refinement)</p> <p>2.3 The structure, function and behavior of animals and their physiological and welfare needs.</p> <p>2.4 Knowledge of activities related to the breeding, production and breeding of animals.</p> <p>2.7 Legislation relating to the care and welfare of animals, the movement of animals and notifiable and reportable diseases.</p> <p>2.11 Principles of effective interpersonal interaction, including communication, leadership, management and teamwork.</p> <p>Skills:</p> <p>1.4 Communicate effectively with customers, the public, professional colleagues and responsible authorities, using language appropriate to the public concerned and in full compliance with confidentiality and privacy.</p> <p>1.6 Work effectively as a member of a multidisciplinary team in the delivery of services.</p> <p>1.8 Be able to review and evaluate literature and presentations critically.</p> <p>1.10 Use their professional capabilities to contribute to the advancement of veterinary knowledge and One Health concept, in order to improve animal health and welfare, the quality of animal care and veterinary public health.</p> <p>1.11 Demonstrate ability to cope with incomplete information, deal with contingencies, and adapt to change.</p> <p>1.12 Demonstrate that they recognise personal and professional limits, and know how to seek professional advice, assistance and support when necessary.</p> <p>1.13 Demonstrate lifelong learning ability and a commitment to learning and professional development. This includes recording and reflecting on professional experience and taking steps to improve performance and skills.</p> <p>1.14 Participate in self-audit and peer review processes to improve performance.</p> <p>1.15 Obtain an accurate and relevant history of the individual animal or animal group and her / their environment.</p> <p>1.20 Assess the physical condition, welfare and nutritional status of an animal or group of animals and advise the client on principles of husbandry and feeding.</p> <p>1.21 Collect, preserve and transport samples, select appropriate diagnostic tests, interpret and understand the limitations of the test results.</p> <p>1.34 Carry out ante-mortem inspection of animals destined for the food chain, also paying attention to welfare aspects; correctly identify conditions that affect the quality and safety of products of animal origin, to exclude those animals whose condition makes their products unsuitable for the food chain.</p>
<p>Assessment</p>	
<p>Learning verifying methods</p>	<p>Livestock Technologies and Hygiene: During the exam, 4 oral questions will be asked, one on bovine or buffalo breeding for milk, one on bovine / buffalo breeding for meat or on sheep or goat breeding, one on pig breeding and one on horse breeding. The questions will NOT be of a didactic type, but they will tend to mimic practical cases from which the student has to demonstrate that he recognizes the correlation of the effect described in the question with the farming technology.</p>



	<p>Aquaculture, poultry and rabbit farming: 2 oral questions will be asked aiming to verify theoretical knowledge, the scientific language use skills and the ability to evaluate and analyze specific case studies related to poultry, rabbit and fish farming. Genetic improvement: oral exam aimed at assessing the candidate's learning outcome and at evaluating (i) the theoretical knowledge relating to the conceptual models underlying traditional and modern genetic improvement practices, knowledge relating to organizational schemes and the main institutional figures involved in the genetic improvement of domestic animal species; critical knowledge of the short- and long-term implications deriving from the different breeding practices; (ii) the ability to apply the knowledge acquired for the purposes of critical evaluation of the various schemes and approaches of genetic improvement and for the interpretation and critical evaluation of information relating to the genetic merit of a breeding animal; (iii) the ability to understand and contextualize the problems and to identify the best choices in the various situations of operational practice; (iv) the ability to present the acquired contents in a clear manner and with the appropriate terminology. The evaluation will make use of real case analyzes and use of problem-based learning approaches.</p> <p>The evaluation achieved in the exam on the subject "Livestock technologies and Hygiene", together with those acquired in the "Rabbit and Poultry Breeding techniques" and "Genetic Improvement" subjects, will contribute to the determination of the final evaluation by the integrated exam "Animal Production 2". The student can take the examination of the three subjects that make up the "integrated exam" in the same session, or a partial test of "Rabbit and Poultry Breeding techniques and "Genetic Improvement", taking the exam of Livestock Technologies and Hygiene in a subsequent session.</p>
<p>Evaluation criteria</p>	<p>Knowledge and understanding:</p> <ul style="list-style-type: none"> - Knowledge about the theoretical foundations relating to the management of the different farming systems - Theoretical knowledge and appropriate terminology relating to the conceptual models underlying traditional and modern breeding practices. Knowledge of organizational schemes and of the main institutional figures involved in the genetic improvement of domestic animal species. Critical knowledge of the short- and long-term implications deriving from the different breeding practices - Basic skills for the critical evaluation of the different schemes and approaches of genetic improvement and genetic prophylaxis and for the interpretation and critical evaluation of information relating to the genetic merit of a breeding animal - Ability to identify the best choices for genetic improvement in the different situations of operational practice and to interact effectively with the various figures involved in the genetic improvement process. <p>Applied knowledge and understanding:</p> <ul style="list-style-type: none"> - Ability to evaluate the quality of business management in the various types of breeding - Applied knowledge on ethical and legal procedures and responsibilities related to the collection of biological material for molecular investigations and the use of "omic" biotechnologies - Understanding of the applicative impact of genetic improvement on traditional and innovative traits (e.g. resilience, adaptability and economic

	<p>and environmental sustainability), on the conservation of biodiversity of zootechnical ecosystems and on the health of domestic animals</p> <ul style="list-style-type: none"> - Ability to consult and understand the literature, the main scientific sites and databases, in order to provide qualified and updated advice on the subjects of genetic improvement and genetic prophylaxis. <p>Autonomy of judgment:</p> <ul style="list-style-type: none"> - Be able to formulate a personal judgment based on the company's data and information, combined with an operational plan for business improvement - Being able, in full autonomy, to indicate the most appropriate solutions for genetic improvement in the different animal species and according to the different selective objectives, demonstrating logical reasoning skills, critical skills and a general overview ability. <p>Communication skills:</p> <ul style="list-style-type: none"> - Knowing how to use specific technical terminology appropriately - Being able to communicate, using the appropriate terminology, and to interact with their peers and within the scientific community, as well as with the animal herders and owners and the different institutions, at different territorial levels, that deal with conservation, management and genetic improvement of animal germplasm. <p>Ability to learn:</p> <ul style="list-style-type: none"> - Demonstrate knowledge of available resources in order to find useful data for business management - Being able to understand, and acquire in a critical way, more specific and always up-to-date knowledge on the issues of conservation, management and genetic improvement of animal germplasm.
<p>Criteria for measuring learning and assigning the final grade</p>	<p>The final grade is awarded out of thirty. The exam is passed when the grade is greater than or equal to 18. Students can access to a unique exam evaluation session, or they can pass a preliminary exam in AQUACULTURE, POULTRY AND RABBIT FARMING, and LIVESTOCK BREEDING and then subsequently pass the final exam in LIVESTOCK TECHNOLOGY AND HYGIENE. The final grade is decided by the whole Commission, also on the basis of the evaluation of the preliminary exam. Anyway, the student must acquire a mark greater than or equal to 18/30 for each part of the exam relating to the three courses</p>
<p>Other</p>	