General information	
Academic subject	**SUSTAINABLE AND PRECISION LIVESTOCK FARMING** (integrated exam of PRODUCTIVE AND REPRODUCTIVE PERFORMANCES OF FARM ANIMALS)
Degree course	Animal Science
Academic Year	2022/2023 - III year
European Credit Transfer and Accumulation System (ECTS)	3
Language	Italian
Academic calendar (starting and ending date)	II Semester
Attendance	Mandatory

Professor/ Lecturer	
Name and Surname	Pasquale De Palo
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Department and address	Campus of Veterinary Medicine, S.P. 62 to Casamassima km 3, 70010 Valenzano (Ba)
Virtual headquarters	Piattaforma Teams
Tutoring (time and day)	Wednesday 14.00-16.00 and Thursday 10.00-12.00 after scheduling a meeting by e-mail.

Syllabus	
Learning Objectives	The course aims to provide students with useful information for evaluating the environmental, economic and social impacts of the various forms of animal breeding and provide the basics on Precision Livestock farming techniques, providing an insight into the state of the art and future prospects of this new discipline
Course prerequisites	The student must already be in possession of the knowledge relating to Animal Nutrition and Feeding, the Physiology and Ethology of farm animals, as well as breeding techniques. Therefore, it is necessary that the student has at least attended the relevant courses with particular attention.
Contents	Concepts of livestock production efficiency and environmental, social and economic impact. Greenhouse gases. Harmful gases. Impact of nitrogen excretions. Agro-ecosystem impact of grazing. Impact reduction strategies and case studies. Carbon footprint. Water Footprint. Calculation techniques (Life Cycle Analysis) of the impacts. Precision Livestock Farming, classification and case studies on PLF systems in the management of livestock food production, animal feeding, reproductive and productive monitoring, animal welfare, milking, traceability of production.
Books and bibliography	Stefanon B., Mele M., Pulina G. Allevamento animale e sostenibilità ambientale. I principi. Franco Angeli Editore, 2018. Material provided by the lecturer during the course, or available at his office.
Additional materials	

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			

U.O. Didattica e servizi agli studenti
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75	***20***	***25***	***30***
ECTS			
3	***2***	***1***	

Teaching strategy	The few lectures will be accompanied by the presentation of case studies. Furthermore, training will be carried out with in-field visits and seminars held by technicians from companies from the PLF field.
Expected learning outcomes	
Knowledge and understanding on:	○ Knowledge on how to recognize the variables affecting the impacts; ○ Knowledge on how to recognize the advantages and disadvantages of a PLF system; ○ Knowledge of the theoretical bases and precision livestock farming tools applied according to the different livestock systems
Applying knowledge and understanding on:	○ Competence in estimating the environmental, social and economic impacts of each farming system, as well as of each farm management choice ○ Competence in recognizing the various inputs and outputs of a livestock system. ○ Knowing how to use the right categories of PLF systems based on the needs highlighted by a farmer. ○ Knowing how to advise the breeder also in relation to the impact of his activity as well as on the correct use, from choice to data management, in the PLF area.
Soft skills	• *Making informed judgments and choices* ○ provide the knowledge bases necessary to allow the student to propose and make decisions aimed at improving the impact and improving management in a livestock farm • *Communicating knowledge and understanding* ○ know the scientific technical terminology of the sector necessary to communicate the topics covered by the subject • *Capacities to continue learning* ○ receive the knowledge bases to be able to deepen the issues covered by the subject.

Assessment and feedback	
Methods of assessment	The final exam takes place in oral form. The student will be asked two questions, one relating to the environmental impact and one to the PLF. He will have to achieve a sufficient assessment for both thematic areas to pass the exam. The questions may be aimed at assessing knowledge. Often cases or data will be presented to the student asking him a critical assessments
Evaluation criteria	• *Knowledge and understanding* ○ Knowledge of theoretical basis of livestock sustainability and PLF technologies • *Applying knowledge and understanding* ○ Being able to assess sustainability of a livestock farming system ○ Evaluating critically the application of a PLF tool to a livestock system • *Autonomy of judgment* ○ Being able to elaborate hypothesis and opinions in case studies • *Communicating knowledge and understanding* ○ Being able to know technical specific language • *Communication skills* ○ Being able to use technical specific language

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	• *Capacities to continue learning* ○ Competent use of tools for continue self-learning
Criteria for assessment and attribution of the final mark	Depending on the skills and competences demonstrated, the student will be assigned the grade expressed in thirtieths, with the possibility of obtaining praise, "laude", if the same has also demonstrated a small, but significant, added value (originality) to the test.
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