



Ph.D. ANIMAL & FOOD COURSE SCIENCE
UNIVERSITY OF PADOVA

DAFNAE
Dipartimento di Agronomia Animali
Alimenti Risorse naturali e Ambiente



UNIVERSITÀ
DEGLI STUDI
DI PADOVA



cost
EUROPEAN COOPERATION
IN SCIENCE & TECHNOLOGY

 **Funded by
the European Union**

Course

Artificial Intelligence and Data-Driven Technologies for Precision Livestock Production

August 31 – September 4, 2026

Instructors:

Dr. Guilherme J. M. Rosa

(<https://rosalab.cals.wisc.edu/>): Professor at the Department of Animal & Dairy Sciences and Department of Biostatistics & Medical Informatics, University of Wisconsin-Madison

Dr. Joao Dorea

(<https://dorealab.cals.wisc.edu/>): Professor at the Department of Animal & Dairy Sciences and Department of Biological Systems Engineering Informatics, University of Wisconsin-Madison.

Course Description

This graduate-level course (PhD and advanced MS) is designed for researchers and professionals in animal sciences, including nutrition, physiology, management, genetics, and reproduction, working in academia or industry, particularly those interested in data analytics, artificial intelligence (AI), and precision livestock systems. Statisticians, engineers, computer scientists, and data scientists seeking applications of AI in biological production systems will also benefit from the course. The program covers key concepts and practical approaches in statistics, machine learning, and AI for high-dimensional and multimodal data in livestock production. Participants will work with real-world datasets derived from sensors, imaging technologies, genomics, acoustic systems, and farm management platforms. Emphasis is placed on deep learning, predictive modeling, multimodal data integration, and AI-driven decision support systems that enhance efficiency, sustainability, and digital transformation in animal agriculture. The course is structured with four sessions per day from Monday to Friday (with Wednesday afternoon reserved for discussion and networking), combining lectures with hands-on demonstrations using real data, software tools, and algorithms that participants can directly apply in research and industry R&D settings.



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Topics

- Big Data and Data Science in Livestock Systems
- Artificial Intelligence in Animal Agriculture
- Planning Research Studies in Data-Intensive Animal Science
- Wearable Sensing Technologies
- Infrared and Hyperspectral Imaging
- Acoustic Monitoring Systems
- Mining Operational Farm Data
- Machine Learning Techniques for Animal Science
- Multidimensional Regression and Classification
- Deep Learning Architectures (CNNs, RNNs, Transformers)
- Large Language Models in Animal Science Applications
- Genomic Prediction and High-Dimensional Genomic Data
- Image Processing and Computer Vision for Livestock
- Multimodal Data Integration
- AI for Precision Nutrition and Health Monitoring

Support for selected trainees will be provided by [COST Action EU-LI-PHE](#) – Information for the application will be shared later (for details: luca.fontanesi@unibo.it)