

**COURSE OF STUDY**            **AGRICULTURAL SCIENCE AND TECHNOLOGY (L-25)**  
**ACADEMIC YEAR**            **2023/2024**  
**ACADEMIC SUBJECT**        **Principles of Animal Nutrition 3 ECTS (module of I.C. Animal Husbandry, 9 ECTS)**

General information	
Academic subject	<b><i>Principles of Animal Nutrition (module of I.C. Animal Husbandry)</i></b>
Degree course	<i>Agricultural Science and Technology</i>
Academic Year	<i>Third</i>
European Credit Transfer and Accumulation System (ECTS)	3
Language	<i>Italian</i>
Academic calendar (starting and ending date)	<i>1<sup>st</sup> semester (09/25/2023 – 01/19/2024)</i>
Attendance	<i>Not obligatory</i>

Professor/ Lecturer	
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Virtual headquarters	
Tutoring (time and day)	Monday and Wednesday, from 14.30 to 15.30. Upon appointment requested by e-mail, tutoring may be performed also in other days and time and by e-learning platforms.

Syllabus	
<b>Learning Objectives</b>	<i>The course aims to provide the basic knowledge about the principles of nutrition and feeding in livestock animals. The features relating to the nutritional characteristics of feeds and by-products commonly used in the formulation of diets will be studied, as well as the knowledge of animal requirements at the basis of feed rationing. Dietary effects on animal welfare and on the production and quality of animal productions will also be studied.</i>
<b>Course prerequisites</b>	<i>Basic knowledge of biochemistry, animal physiology and anatomy.</i>
<b>Contents</b>	<i>Chemical composition of feeds for livestock: carbohydrates, lipids, nitrogenous compounds, minerals and vitamins. Evaluation of feed quality. Digestion, absorption and metabolism in monogastric and ruminant species. Nutritional value: digestibility, systems of expression of the energy and protein value in the different species. Animal feeds: green and preserved fodder (hay, haylage, silage), cereals and their by-products, oilseeds and by-products. Residues from the food/feed industry, mineral and vitamin supplements, additives. Nutritional requirements and rationing factors of livestock species in maintenance, gestation, growth, production (meat, milk, eggs). Rationing for animals in livestock production: cattle, sheep, goat, pig, horse, rabbit and poultry. Feed technology: principles of legislation on feed preparation and innovative technological treatments of zootechnical feeds.</i>
<b>Books and bibliography</b>	<ul style="list-style-type: none"> <li>• Antongiovanni M., Gualtieri M. <i>Nutrizione e alimentazione animale. Edagricole, 1998.</i></li> </ul>

	<ul style="list-style-type: none"> <li>• <i>Borgioli E. Nutrizione e alimentazione degli animali agricoli. Edagricole, 1991.</i></li> <li>• <i>Martin Rosset W. L'alimentazione dei cavalli. Edagricole, 1994.</i></li> <li>• <i>Mordenti, N. Rizzitelli, D. Cevolani, Manuale di alimentazione del suino. Edagricole, 1992.</i></li> </ul>
<b>Additional materials</b>	<ul style="list-style-type: none"> <li>• <i>Lesson notes.</i></li> <li>• <i>Scientific papers.</i></li> </ul>

<b>Work schedule</b>			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
<b>Hours</b>			
75	16	14	45
<b>ECTS1</b>			
3	2		1.8
<b>Teaching strategy</b>		<i>The course contents will be treated by means of PowerPoint presentations and videos in the classroom.</i>	
<b>Expected learning outcomes</b>			
<b>Knowledge and understanding on:</b>		<ul style="list-style-type: none"> <li>○ <i>Feeds commonly used in livestock production (pasture, haylage, silage, by-products, etc.) in relation to animal species (cattle, sheep and goats, pigs, horses, poultry and rabbits);</i></li> <li>○ <i>field and laboratory techniques for the assessment of the nutritional value of animal feeds;</i></li> <li>○ <i>principles of feed formulation in relation to animals' requirements, in compliance with current regulations.</i></li> </ul>	
<b>Applying knowledge and understanding on:</b>		<ul style="list-style-type: none"> <li>○ <i>Ability to put in relation animal feeding with the yield and quality of livestock production.</i></li> </ul>	
<b>Soft skills</b>		<ul style="list-style-type: none"> <li>• <i>Making informed judgments and choices</i> <ul style="list-style-type: none"> <li>○ The student must show to be able to formulate personal judgments, including the autonomous processing and application of learned knowledge and skills.</li> </ul> </li> <li>• <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ The student must be able to describe the context by using a clear and proper terminology.</li> </ul> </li> <li>• <i>Capacities to continue learning</i> <ul style="list-style-type: none"> <li>○ The student must be able to re-elaborate the concepts learned, demonstrating the ability to solve new and complex theoretical-practical problems in other contexts.</li> </ul> </li> </ul>	

<b>Assessment and feedback</b>	
Methods of assessment	<i>Profit will be assessed by an oral exam that will focus on the topics of the program. The student must show the skills acquired during the course, i.e. the knowledge of: the principles of animal nutrition; the effects of animal nutrition on the quality of livestock production; the proper terminology to describe livestock production.</i>
Evaluation criteria	<ul style="list-style-type: none"> <li>• <i>Knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ The student must prove knowledge and understanding of the teaching contents, including the ability to process data, set theoretical schemes and make critical interpretation of the concepts.</li> </ul> </li> <li>• <i>Applying knowledge and understanding</i></li> </ul>

	<ul style="list-style-type: none"> <li>○ The student must show application skills, also by approaching problems and finding possible solutions.</li> <li>● <i>Autonomy of judgment</i> <ul style="list-style-type: none"> <li>○ The student must show to be able to formulate personal judgments, including the autonomous processing and application of learned knowledge and skills.</li> </ul> </li> <li>● <i>Communicating knowledge and understanding</i> <ul style="list-style-type: none"> <li>○ The student must show application skills, also by approaching problems and finding possible solutions.</li> </ul> </li> <li>● <i>Communication skills</i> <ul style="list-style-type: none"> <li>○ The student must be able to use in a clear and proper way the scientific and technical terminology.</li> </ul> </li> <li>● <i>Capacities to continue learning</i> <ul style="list-style-type: none"> <li>○ The student must be able to re-elaborate the concepts learned, demonstrating the ability to solve new and complex theoretical-practical problems.</li> </ul> </li> </ul>
<p>Criteria for assessment and attribution of the final mark</p>	<p><i>For students enrolled in the current year, an exemption test is foreseen, halfway through the course, which consists of an oral exam. The outcome of this test, expressed as a vote out of thirty, is valid for one academic year.</i></p> <p><i>During the oral exam, the acquisition of knowledge on the topics developed during the theoretical and theoretical-practical lessons in the classroom, in the laboratory and/or in livestock/feed companies will be ascertained, as reported in the Academic Regulations of the Degree Course (art. 9) and in the related study plan (Annex A).</i></p> <p><i>The student will have to demonstrate the acquisition of: knowledge of the principles of animal nutrition; the ability to use specific language; knowledge and skills related to the influence of animal feed on the yield and quality of livestock production.</i></p>
<p><b>Additional information</b></p>	