

General information	
Academic subject	Biochemistry 2
Degree course	Veterinary Medicine
Academic Year	2021/2022
European Credit Transfer and Accumulation System (ECTS)	6
Language	Italian
Academic calendar (starting and ending date)	III Bimester
Attendance	Mandatory

Professor/ Lecturer	
Name and Surname	Elisabetta Casalino
E-mail	elisabetta.casalino@uniba.it
Telephone	+39 80 5443864
Department and address	Veterinary Medicine Campus – Valenzano (BA)
Virtual headquarters	Teams platform, cod: zitea26
veterinaryTutoring (time and day)	Every day, from Monday to Friday, by appointment

Syllabus	
Learning Objectives	The course aims to provide students with basic knowledge relating to the main metabolic pathways of the cell, by correlating with the production of energy and its use, which contribute to the metabolic function of the cell and the whole organism.
Course prerequisites	Prerequisites: General and Inorganic Chemistry The student must also have acquired knowledge and skills relating to the general concepts of physics, especially thermodynamics, and cytology, with particular regard to the knowledge of the structure of the eukaryotic cell.
Contents	<p>METABOLIC BIOCHEMISTRY</p> <p>Bioenergetics and metabolism: The thermodynamics of living matter. Compounds with a high energy level. Cellular energy charge and ATP reactions. Redox reactions of biological interest.</p> <p>Oxidative phosphorylation: The respiratory chain. Chemiosmotic theory of oxidative phosphorylation. Inhibitors and decouplers of oxidative phosphorylation.</p> <p>Carbohydrate metabolism in species of veterinary interest: Glycolysis. Glycogenolysis and glycogenosynthesis. gluconeogenesis. Cori cycle. Pentose-phosphate cycle. Regulation of carbohydrate metabolism.</p> <p>Citric acid cycle: The reactions of the cycle and their regulation. Anaplerotic reactions of the cycle.</p> <p>Lipid metabolism in species of veterinary interest: Beta-oxidation of fatty acids. Biosynthesis of fatty acids. Synthesis of ketone bodies</p> <p>Protein metabolism in species of veterinary interest: Protein turnover. Degradation of amino acids. Elimination of protein nitrogen. Urea cycle.</p> <p>FUNCTIONAL BIOCHEMISTRY</p> <p>Rumen biochemistry: Rumen metabolism of polysaccharides, nitrogenous substances and lipids. Vitamins and mineral elements in rumen fermentations.</p> <p>Biochemistry of signaling: Molecules involved in the transduction mechanism. General characteristics of signal transduction. Main types of receptors. Primary messengers. Secondary messengers.</p> <p>Biochemistry of oxidative stress: Oxygen, reactive and radical species: Functions of</p>

	radicals and ROS. Damage from radicals and ROS. Defenses against radicals and ROS. The antioxidant compounds. Endogenous and exogenous antioxidants. Natural and synthetic antioxidants. Oxidative stress in veterinary medicine and animal production
Books and bibliography	- Siliprandi& Tettamanti -BIOCHIMICA MEDICA.–Piccin Editore - Berg & Stryer – BIOCHIMICA – Zanichelli Editore
Additional materials	Books can be supplemented by lecture notes and slides projected in class (available on the google drive platform)

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
150	40	25	85
ECTS			
6	6		
Teaching strategy	The theoretical part of the course takes place in classrooms equipped with PC, projector and internet connection, using power point slides. The practical lessons are carried out in the suitably equipped laboratory of the biochemistry section. The students, subdivided into small groups of 8-10 people and assisted by the teacher, will approach, individually or in small groups, the laboratory techniques covered by the exercise		
Expected learning outcomes			
Knowledge and understanding on:	<ul style="list-style-type: none"> ○ The student will have to know the fundamental concepts of cellular biochemistry ○ The student will have to know the application of biochemical laboratory techniques more closely related to the medical-veterinary field 		
Applying knowledge and understanding on:	<ul style="list-style-type: none"> ○ The student must be able to correlate the molecular mechanisms regulating the different cellular functions, their role in physiological processes and their observable modifications in the course of pathologies 		
Soft skills	<p>Making informed judgments and choices</p> <ul style="list-style-type: none"> ○ The student should be able to understand how the acquired knowledge can be applied to basic research and applied to the various contexts of veterinary science: animal welfare, animal production, food inspection and hygiene. ○ Communicating knowledge and understanding the student must be able to present the acquired knowledge with the appropriate scientific terminology <p>Capacities to continue learning</p> <ul style="list-style-type: none"> ○ The student must also be able to autonomously approach the update sources relating to the subject in question (databases, publications accredited nationally and internationally) 		

Assessment and feedback	
Methods of assessment	The assessment of knowledge takes place through an oral test.
Evaluation criteria	<ul style="list-style-type: none"> • Knowledge and understanding <ul style="list-style-type: none"> ○ The student should be able to describe the different cellular metabolic pathways



	<ul style="list-style-type: none"> ○ Applying knowledge and understanding ○ The student should be able to correlate the role of macromolecules in cellular metabolic pathways in relation to the state of the organism as a whole. <p>Autonomy of judgment</p> <ul style="list-style-type: none"> • The student should be able to autonomously organize a broad speech illustrating a certain process using all the knowledge acquired. • Communicating knowledge and understanding <ul style="list-style-type: none"> ○ the student must be able to present the knowledge acquired during the course using the appropriate terminology <p>Communication skills</p> <ul style="list-style-type: none"> ○ The student must be able to use the appropriate scientific terminology in a clear and simple way, understandable even to those who do not have in-depth knowledge of the subject • Capacities to continue learning <ul style="list-style-type: none"> ○ The student must be able to correlate the knowledge acquired by integrating and harmonizing them with the concepts previously acquired in the other related disciplines (eg: physics, chemistry ...)
<p>Criteria for assessment and attribution of the final mark</p>	<p>The final grade is expressed out of thirty. The exam is passed when the grade is greater than or equal to 18/30. Knowledge of all metabolic pathways is an essential requirement for passing the exam. The use of correct scientific terminology, the ability to correlate the various metabolic pathways, as well as the ability to organize a discourse by spacing and correlating the various concepts acquired, will contribute to the increase of the final grade</p>
<p>Additional information</p>	