Code of subject	M_WE_SEM3 BIOCH 2 ANG
Field of study	Veterinary medicine
Name of the training module including the Polish name	Biochemistry 2 Biochemia 2
Language of instruction	English
Type of the training module	obligatory
Level of the training module	Master level
Form of studies	Full-time
Location in the programme (year)	II
Location in the programme (semester)	III
Number of ECTS credits with a division into contact/noncontact	6,0 (3,56/2,44)
Name and surname of the person in charge	Prof. dr hab. Marta Kankofer
Unit offering the subject	Department of Biochemistry; Faculty of Veterinary Medicine
Aim of the module	The aim of biochemistry 2 course is to acquaint students with biochemical pathways which happen within cells and tissues and which are indispensable for proper functioning of cells, their regulation and integration within cells. Moreover, students get knowledge about selected techniques used in biochemical laboratory. This knowledge is necessary for integration of theoretical and practical topics, clinical reasoning and understanding pathological processes on cellular level as well as the interpretation of laboratory tests which are used during clinical subjects.
Learning outcomes – the total number of learning outcomes may not exceed (4-8) for the module. The description of the intended learning outcomes that a student should achieve after the completion of the module should be provided. The outcomes for all forms of classes used should be presented.	Knowledge:
	Student knows and understands: K1 – metabolic pathways of macromolecules and their regulation on cell level
	K 2 – tissue specifics of metabolism and hormonal regulation
	K 3 – use of analytical methods applied for veterinary diagnostics (indicative enzymes, digestive enzymes, biochemical parameters of blood, urine, milk)
	Skills:
	Student is able: S 1- to exert understanding for the necessity of constant studies
	S 2 – to perform the determinations of selected biochemical parameters with the use of laboratory equipment
	Social competences:
	Student is ready to: Sc1 - self study and self improvement
	Sc2 – understand his limitations
Preliminary and additional requirements	Passing biochemistry 1

Contents of the training module – a compact description of approx. 100 words.	**Lectures**: Digestion of proteins, polysaccharides, lipids. Mechanisms of absorption and further fate of products of digestion. Metabolic pathways of aminoacids (transamination, deamination, decarboxylation), neutralisation of ammonia ions (urea cycle, synthesis of glutamine), metabolic pathways of purine and pirymidine bases. Metabolic pathways of polysaccharides (glycolysis, pentose-phosphate cycle, gluconeogenesis, glycogen metabolism) and lipids (beta oxidation, synthesis of fatty acids and lipids,ketogenesis) – meaning of cycle, energetics, regulation. Krebs Cycle and resporatory chain, integration of metabolism (mechanism of action of hormones), selected topics on detoxication (metabolism of xenobiotics) as well as tissue specificity (biochemistry of vision) and body fluids. **Practicals**: determination of activity of indicative enzymes (AST, ALT, AP), digestive tract hydrolases (pepsin, trypsin, pancreas lipase and amylase), succinate dehydrogenase, the evaluation of biochemical parameters of blood,urine, milk and bile
Recommended and obligatory reading list	1. Harpers Biochemistry 2. Kaneko – Clinical biochemistry 3. Stryer – Biochemistry 4. Specialistic scientific papers
The intended forms/activities/ teaching methods	Laboratory classes, lectures, materials for selfstudy available on Web page of Departament as well as in Internet upon invitation (Casus,VikiWet)

<table>
<tr><td>Methods of verification and documentation forms of the achieved learning outcomes</td><td colspan="3">Passing module Biochemistry 2 is possible based on:
- the presence during practicals (one absence is allowed)
- obtaining minimum number of points for activity during practicals – details are in rules for passing module hanging in classroom; teacher verifies learning outcomes during each practical giving 0-2points for knowledge, 0-2 points for laboratory skills and 0-2 points for report about results of laboratory experiments (card of student).
- the preparation of essay on selected topic;
- obtaining positive grades in 4 inter-semester evaluations of knowledge (metabolic pathways of aminoacids, polysaccharides, lipids as well as integration of metabolism);
- passing exam on practical laboratory skills based on individual determination of quantitative assay (the concentration of chlorides in urine)
Final grade is mean value of 4 evaluations of knowledge (90% plus 10% for practical exam). Final grade can be increased or decreased for half of grade based on obtained points for activity during practicals and essay.
During semester Student gets access to materials for self study (virtual cases) which are located on digital platform Casus. Knowledge and skills which are obtained during studying these materials are verified during final exam. One of questions always concerns these topics.
Exam consists of 2 parts. The first covers writting two metabolic pathways with chemical formulas and the second covers answers to 8 open questions. Each question is assessed in accordance to 2-5 scale and final grade is mean value of all questions. The condition of passing final exam is passing the first part.
If student will not pass final exam, he is able to repeat module Biochemistry 2 on conditions presented above.</td></tr>
<tr><td rowspan="8">Balance of ECTS credits</td><td>Form of classes</td><td>Contact hours</td><td>ECTS points</td></tr>
<tr><td>Lectures
Practicals
Consultations
retake tests
Exam</td><td>30,0
45,0
5,0
3,0
6,0</td><td>1,2
1,8
0,2
0,12
0,24</td></tr>
<tr><td></td><td>Noncontact hours</td><td></td></tr>
<tr><td>Preparation to classes:
Preparation of essay:
Preparation to evaluation of knowledge:
Preparation to exam:</td><td>20,0
8,0
10,0
23,0</td><td>0,8
0,32
0,4
0,92</td></tr>
<tr><td>Total</td><td>150 godz.</td><td>6,0</td></tr>
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Number of contact hours	30 h Lectures; 45 h Practicals; 5 h consultations; 3h retake tests 6 h exam Total 89 h - reflects 3,56 ECTS points
Relationship between subject learning outcomes and veterinary studies learning outcomes	K1 – A.W4.+++, B.W1.+; K2 - A.W2.+ B.W2.+; K3 - A.W11.+,B.W5.+ S1 - A.U4.++ A.U5.++; S2 - B.U6.+ B.U7.+ C1 - K4)+K8)+; C2 - K5)+K7)+
Impact of selected compounds to final grade	Final grade is mean value calculated in the following way: 80% - grade obtained in final exam; 10% - grade obtained in Biochemistry 1; 10% - grade obtained in Biochemistry 2