

Module code	M_WE_SEM5 PW 1D/2D BIOMAT
Field of study	Veterinary medicine
Module name, also the name in English	Biomaterials
	Biomateriały
Language of instruction	English
Module type	Elective
Level of studies	Long-cycle master's degree studies
Form of study	Full-time
Year of study in the field of study	III
Semester of study in the field of study	V
ECTS credits, divided into contact/non-contact hours	1 (0.6/0.4)
Academic title/degree, name of the person responsible for the module	Prof. dr hab. Izabela Polkowska
Unit teaching the module	Department and Clinic of Animal Surgery
Module objective	The course aims to familiarise the students with the use of biomaterials in soft tissue regenerative surgery and orthopaedic diseases in different animal species, taking into account specific diseases. Students will be introduced to the use of biomaterials for tissue anastomosis (surgical sutures, tissue cements, bone adhesives). Possible responses of biomaterials to stimuli from both the implantation environment and the external environment are also discussed. Other topics discussed during the class include biomaterial degradation and biotolerance – biological compatibility.
The learning outcomes for the module include a description of the knowledge, skills and social competences that the student will gain after completing the module.	Knowledge:
	K1 The student has a general knowledge of the types and applications of biomaterials in veterinary medicine.
	K2 The student implements the principles of diagnostic and therapeutic procedures in relation to the use of biomaterials in veterinary medicine, depending on the expected effects
	Skills:
	S1 The student demonstrates the ability to work with representatives of different entities in the application of biomaterials in veterinary medicine
	S2. The student skillfully interviews a patient during a clinical examination to conduct biomaterial treatment. The student is aware of the need to cooperate with representatives of other medical professions to select optimal solutions with the use of modern, effective biomaterials.
	S3 The student demonstrates the ability to analyse and select the optimal solutions in applying biomaterials
	Competences:
C 1. Performing planning and treatment activities for selected diseases in individual animal species while critically and objectively evaluating the opportunities and limitations of using biomaterials	

	<p>C 2. The student is willing to update his or her knowledge and comply with the principles of professional ethics in applying solutions utilising biomaterials. The use of biomaterials is intended to treat the patients' ailments and enhance their lives. The student is aware of the above issues and recommendations when choosing a treatment option that utilises biomaterials.</p>
Preliminary and additional requirements	According to the sequence of subjects
Module program content	<p>Lecture topics:</p> <ol style="list-style-type: none"> 1. Biomaterials in veterinary medicine. Possibilities, advantages and disadvantages of using biomaterials. 2. Use of biomaterials in specific animal species with specific diseases. Common features and differences. 3. Biomaterials as intelligent materials – properties and responses to stimuli from the implantation environment. 4. Use of biomaterials in small animals with specific diseases. 5. Use of biomaterials in large animals with specific diseases. 6. Biomaterials in limb prosthetics. 7. Use of biomaterials in orthopaedic limb diseases in dogs and cats. 8. Biomaterials in regenerative medicine. Biomaterial requirements in the light of current issues in veterinary dentistry. 9. Use of biomaterials in ophthalmology – diseases of the cornea, iris and lens. 10. Treatment of eye disorders, as well as congenital and allergic defects using biomaterials. 11. Metallic biomaterials. Types, applications, and possible complications of implantation in animals. 12. Use of biomaterials in vascular surgery. Vascular prostheses – stents – implantation possibilities in veterinary medicine. 13. Tissue anastomosis using biomaterials. Surgical sutures, tissue cements, bone adhesives. 14. Complications following the use of biomaterials, with the discussed diseases taken into account. 15. Biomaterial degradation. Biotolerance – biocompatibility.
List of core and supplementary literature	<ol style="list-style-type: none"> 1. Fossum T.W.: Small Animal Surgery Volumes 1, 2, and 3. Elsevier 2009. 2. Schebitz H., Brass W.: Surgery of dogs and cats, 2009. 3. Saunders: "Oral and Maxillofacial Surgery in Dogs and Cats". Elsevier 2012.
Planned forms/activities/teaching methods	<ol style="list-style-type: none"> 1. The student discusses the applicability of the biomaterial in a given disease entity in the presence of the course instructor. 2. As the course instructor presents a variety of biomaterials, the student prepares biomaterials for application to anatomical training models. 3. Discussion.

<p>Verification methods and ways of documenting the achieved learning outcomes.</p>	<p>The course is conducted in the form of interactive lectures. Lectures are in the form of original multimedia presentations describing the main practical and clinical issues. During lectures, students learn about the types of biomaterials and their use in relation to diseases in different animal species. Together with the course instructor, the students discuss surgical treatment options, taking into account both surgical and economic aspects to choose medical solutions. Throughout the lectures, the course instructor comments on specific aspects of the use of biomaterials in veterinary medicine. Advantages, disadvantages and potential complications of using biomaterials are discussed as well.</p> <p>Credit is verified by the students' preparation of a presentation (70% of the grade) and oral answers to questions related to it (30% of the grade), at the end of the semester. The instructor asks the students questions and grades their answers on a scale of 2 to 5. The presentation is graded on a scale of 2 to 5.</p> <p>A grading scale of 2 to 5 for each part:</p> <p>2 not sufficient - less than 60%</p> <p>3 sufficient - 61-70%</p> <p>3+ sufficient plus - 71 -75%</p> <p>4 good - 76-85%</p> <p>4+ good plus - 86-90%</p> <p>5 very good - 91-100 %</p> <p>The 1st and 2nd test attempt follow the same format. No additional means of verifying learning outcomes (form, number) apart from those specified are envisaged.</p>																																			
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<p>Relation of module learning outcomes to course learning outcomes.</p>	<p>K1 – WE_W17++, WE_W18++, K2 - WE_W07++, WE_W21++ S1 - WE_U1++, WE_U4+ S2 - WE_U1++, WE_U2++ S3 – WE_U6+, WE_U7++ , WE_U8D++ Sc1 – WE_K1++,WE_K5+, WE_K6++ Sc2 – WE_K8++, WE_K2++, WE_K3++</p>																																			

Elements and values affecting the final grade	Final grade: Attendance at lectures (i.a. 80% attendance) according to the current study regulations - weighting of 10% A credit for the presentation prepared by students - weighting of 60% Oral answer on the prepared presentation - weighting of 30%
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