Module code	M_WE_SEM10 PW 1H/2H ECHO
Field of study	Veterinary medicine
Module name	Canine and feline echocardiography in practice Echokardiografia psów i kotów w praktyce
Language of instruction	English
Module type	elective
Level of studies	Long-cycle Master's Degree studies
Mode of study	Full-time
Year of study in the field of study	VI
Semester of study in the field of study	XI
ECTS credits, divided into contact/non-contact hours	1 (0.6/0.4)
Academic title/degree, name of the person responsible for the module	Dr Andrzej Milczak (Co-Principal Investigator: vet. Karolina Wrześniewska)
Unit teaching the module	Department and Clinic of Internal Animal Diseases, Division of Internal Diseases of Companion Animals
Module objective	Acquiring skills in practical acquisition of echocardiographic images and their interpretation in small animals with suspected cardiac disease. Using ultrasound images to make diagnoses, estimate prognosis, and monitor treatment in dogs and cats.
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. Knows techniques for performing M-mode projection echocardiography.
	K2. Knows techniques for performing projection and B-mode echocardiography with Doppler flow studies.
	Skills:
	S1. Is able to prepare a patient for echocardiography and perform and describe basic echocardiographic projections
	S2. Is able to appropriately conduct a history and analysis of a cardiac case based on an interview with the pet owner.
	Social competences:
	C1. Is ready for lifelong learning, can inspire and organize the learning process of others.
	C2. Is prepared to solve problems related to the profession.
	C3. Is ready to work in a group, taking on a variety of roles within the group.

Prerequisites and additional requirements	• Biophysics - basic information about the propagation of sound waves in liquids and solid matter. • Animal physiology - knowledge of heart mechanics and blood flow • Animal pathophysiology - knowledge of the pathology of cardiovascular disease in small animals • Clinical and laboratory diagnostics - cardiovascular testing • Internal diseases of dogs and cats - diseases of the reproductive system
Module programme content	Each topic covers one lesson hour 1. Echocardiography in practice - B-mode projections. (tutorials) 2. Echocardiography in practice - B-mode projections. 3. Echocardiography in practice - B-mode projections. 4. Echocardiography in practice - M-mode projections. (tutorials) 5. Echocardiography in practice - M-mode projections. 6. What is Doppler echocardiography? (tutorials) 7. Pulse wave Doppler study. 8. Continuous wave Doppler study. 9. Color Doppler echocardiography technique. 10. Pulmonary hypertension in heart disease. 11. Acquired heart defects. (tutorials) 12. Acquired heart defects. 13. Congenital heart defects - a case review. (tutorials) 14. Pulmonary hypertension in heart disease. 15. Course credit.
List of core and supplementary literature	Required literature: Boon J.A.: Veterinary Echocardiography. Wiley – Blackwell, 2011 Richard W. Nelson, C. Guillermo Couto: Small Animal Internal Medicine. 5th Edition, 2014 Supplementary literature: June Boon**:** Two Dimensional and M-mode Echocardiography for the Small Animal Practitioner. Blackwell, 2017
Planned forms/activities/teaching methods	Lectures with multimedia presentations, elements of academic tutoring (case study). Methods of didactic games (elements of drama) - applies to tutorials. A model of experiential learning, shaping the skills of practical echocardiographic examination, documenting and archiving of examination results. Preparing study reports.

<table>
<tr><td>Verification methods and ways of documenting the achieved learning outcomes.</td><td>

K1, K2 - final assessment test. The final test to earn credit includes the exercise material and additional issues made available to students at the beginning of the semester. The test consists of 30 questions. A student may earn between 18 and 30 credit points.
S1 - S2 - performance of the practical task assessed on the basis of a written report drawn up after each exercise. Report forms are made available to students at the beginning of each exercise and reviewed no later than 2 weeks prior to the date of end-of-term examinations. Each of the 14 reports is rated on a scale of 0 to 5 credit points. Reports for which the student has received 0 credit points should be corrected within 2 weeks. The average score for all reports submitted is considered for the final grade.
C1 - C3 - point assessment of the student's work in a team during exercises. During each exercise, the student's work is subject to evaluation (involvement in the research, diligence, cooperation with other group members). A student may earn between 0 and 2 credit points.

The final grade is based on the sum of the points earned from the final credit, report evaluation, and student work evaluation: 20 - 22 points. - sufficient; 23 - 27 pts. - sufficient+; 28 - 33 points. - good; 34 - 35 points. good+; >35 points. – very good.
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<tr><td>ECTS credits</td><td>
<table>
<tr><td colspan="3">CONTACT</td></tr>
<tr><td></td><td>Hours</td><td>ECTS</td></tr>
<tr><td>Practical classes</td><td>14</td><td>0.56</td></tr>
<tr><td>colloquium in practical classes</td><td>1</td><td>0.04</td></tr>
<tr><td>TOTAL contact hours</td><td>15</td><td>0.6</td></tr>
<tr><td colspan="3">NON-CONTACT HOURS</td></tr>
<tr><td>preparation for classes</td><td>6</td><td>0.24</td></tr>
<tr><td>learning from books</td><td>4</td><td>0.16</td></tr>
<tr><td>TOTAL non-contact hours/ ECTS credits</td><td>10</td><td>0.4</td></tr>
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<tr><td>The workload of activities that require direct participation of an academic teacher</td><td>
<table>
<tr><td>attendance at practical classes</td><td>14</td><td>0.56</td></tr>
<tr><td>written credit for exercises</td><td>1</td><td>0.04</td></tr>
<tr><td>TOTAL of practical character</td><td>15</td><td>0.6</td></tr>
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<tr><td>Relation of module learning outcomes to major learning outcomes</td><td>K1. – AW2, BW1, BW2, BW5;
K2. – BW4, BW5
S1. – BU7, BU12;
S2 - BU7, BU12;
C1. – K8, K9;
C2. – K3;
C3. – K1, K2, K3
K - +++; S - ++; C - +</td></tr>
<tr><td>Elements and values affecting final grade</td><td>

Final test score - 48 - 81%
Performance of the practical task - 0 - 13.5%
Point evaluation of the student's teamwork during exercise performance - 0 - 5.5%

The minimum score must not be less than 54%.
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