

Module title:	<b>Bacteriological and mycological laboratory diagnostics of skin infections in dogs and cats</b>	<b>ECTS</b>	<b>1</b>
Polish translation:	<b>Diagnostyka bakteriologiczna i mykologiczna zakażeń skóry psów i kotów</b>		
Course:	<b>Veterinary Medicine</b>		

Module language:	<b>English</b>	<b>Stage: JM-FVM</b>	
Form of studies: <input checked="" type="checkbox"/> intramural <input type="checkbox"/> extramural	Type of module: <input type="checkbox"/> basic <input checked="" type="checkbox"/> <b>directional</b>	<input type="checkbox"/> mandatory <input checked="" type="checkbox"/> <b>elective</b>	Semester: <b>5</b> <input checked="" type="checkbox"/> <b>winter semester</b> <input type="checkbox"/> summer semester
Academic year:	<b>2022/2023</b>	Catalogue number:	<b>FVM-V-JMSS-05W-ED02_22</b>

<b>Module coordinator:</b>	<b>Dr. Ada Schollenberger DVM, PhD</b>
<b>Teachers responsible for the module:</b>	<b>Academic teachers of the Institute of Veterinary Medicine, Department of Preclinical Sciences, Department of Small Animal Diseases with Clinic as well as PhD candidates according to the internal legal acts; visiting professors; other specialists in the field of study</b>
<b>Objectives of the module:</b>	<p><b>To improve knowledge and familiarize students with specific guidelines for skin and ear specimen collection. Remind students of basic protocols for isolation and identification of bacteria and fungi that cause skin infections. Laboratory practice of direct microscopic examination of skin, nail scrapings and hair. Acquire knowledge to accurately perform and interpret drug susceptibility testing, necessary for identification of multidrug resistance strains. Students are expected to perfect their skills in interpretation of laboratory results.</b></p> <p><b>Plan of Practicals (total 15 hours; each practical is 3 hours):</b></p> <ol style="list-style-type: none"> <li><b>Specific guidelines for specimen collection and transport. Ear and skin swabs. Skin and nail scrapings for dermatophytes fungi. Initial processing for bacteria and fungi cultures.</b></li> <li><b>Isolation of pure bacterial and yeast culture. Identification of aerobic and facultatively anaerobic bacteria with phenotypic tests.</b></li> <li><b>Identification of yeasts, preliminary tests, definitive tests. Antimicrobial susceptibility tests for bacteria and yeasts.</b></li> <li><b>Direct microscopic examination for ringworm. Identification of filamentous fungi. Measuring the yeasts inhibition zone in drug susceptibility tests.</b></li> <li><b>Skin microbiome Interpretation of laboratory results. Molecular methods for identification. Evaluation of students individual protocols.</b></li> </ol>
<b>Teaching forms, number of hours:</b>	<p><b>a) Laboratory classes (practicals); hours 15</b></p> <p>In case of unforeseen, unusual circumstances mandatory remote teaching and remote assessment methods might be adopted. Therefore. No other forms of teaching except from so-called hybrid form consisting of practicals in contact and as online classes, are planned</p>
<b>Teaching methods:</b>	<p>Practical laboratory exercises in the isolation and identification of bacterial and fungal skin pathogens. Students work in pairs with one specific clinical specimen. During practicals, students will perform subsequent steps of microbiological diagnostics: specimen collection and transport; obtaining ear and skin swabs; skin and nail scrapings for dermatophytes fungi; initial processing for bacteria and fungi cultures; isolation of pure bacterial and yeast culture; identification of aerobic and facultatively anaerobic bacteria; identification of yeasts, preliminary tests, definitive tests; antimicrobial susceptibility tests for bacteria and yeasts; molecular methods for organisms identification; direct microscopic examination for ringworm; identification of filamentous fungi; measuring the yeasts inhibition zone in drug susceptibility tests. Students prepare the protocol from each step of investigations. The protocol stands for 25% of final grade.</p> <p>Consultations with teachers – 1h per week.</p> <p>Additional meetings with students in a form of consultations: 2h/week.</p> <p>Detailed schedule will be defined by the coordinator of the course at the beginning of semester.</p> <p>Detailed organization of consultations will be defined by the coordinator of the course at the beginning of semester.</p>

<b>Formal prerequisites and initial requirements:</b>		Obtaining positive evaluation in Veterinary Microbiology. Practical classes include procedures that students have learned during the subject of Veterinary Microbiology.		
<b>Learning effects</b>		<b>Course outcomes:</b>	Learning outcomes relative to the course outcomes	Impact on the course outcomes *
<b>Knowledge:</b>	1	Student understands the molecular basis of virulence of microorganisms	A.W.1	3
			A.W.4	1
			A.W.10	3
			A.W.13	3
			B.W.1	3
	2	Student understands the phenomena that make up colonization, infection and disease, knows the mechanisms of opportunistic infections	A.W.10	3
			A.W.11	3
			B.W.1	2
			B.W.2	3
	3	Student knows the principles of aseptics, disinfection, antiseptics and chemotherapy and skillfully uses them in laboratory work	B.W.3	3
			A.W.10	3
			A.W.11	3
			A.W.17	3
B.W.4			3	
4	Student uses English and Latin medical nomenclature	B.W.6	3	
		C.W.3	3	
		A.W.20	3	
	5	Student knows animal infectious agents, epidemiology and pathogenesis of bacterial and fungal skin diseases of dogs and cats	A.W.10	3
			A.W.111	3
			A.W.12	3
			A.W.13	3
			A.W.15	3
	6	Student broadens knowledge about the occurrence of multi-drug resistant strains of microorganisms	A.W.17	3
			A.W.18	3
			B.W.2	1
			A.U.10	3
			A.U.11	3
<b>Skills:</b>	1	Student can collect, analyse and correctly interpret clinical data and microbiological test results	B.U.3	3
			B.U.20	3
			A.U.12	1
			A.U.13	2
	2	Student understands the responsibility of the veterinarian in relation to the animal and its owner	A.U.16	3
			A.U.19	3
			B.U.1	2
			B.U.1	2
	3	Student can collect, protect samples and prepare them for transport	A.U.6	3
			B.U.14	2
			B.U.23	3
	4	Student can perform standard laboratory tests, as well as correctly analyses and interprets the results of laboratory tests	B.U.7	2
			B.U.25	3
	5	Student can estimate the risk of contamination and microbial infection and takes appropriate action	A.U.11	3
			B.U.14	3
			B.U.22	2
	6	Student can thoroughly conduct a veterinary and medical history and collect the animal's medical history	A.U.12	2
			A.U.13	3
A.U.14			3	
B.U.2			3	
B.U.3			3	

<b>Competences:</b>	1	Student shows responsibility for decisions made during animal diagnosis and treatment	K.S.1	3
	2	Student obeys ethical principles	K.S.2	3
	3	Student makes decisions about the need to disinfect animals' living places and to improve biosecurity measures	K.S.1	3
			K.S.2	3
			K.S.4	3
	4	Student draws conclusions from the conducted clinical trial and uses additional sources of information to select the appropriate treatment	K.S.5	3
			K.S.7	3
			K.S.8	3
	5	Student is ready to cooperate and consult other people and share her/his knowledge with others	K.S.3	3
			K.S.9	3
			K.S.11	3
	6	Student is ready to use her/his knowledge and skills in further stages of education	K.S.4	3
K.S.6			3	
K.S.8			3	
			K.S.9	3
<b>Objectives of the module required to obtain learning effects:</b>	Students work in pairs preparing a protocol from specific clinical case. They prepare the protocol from each step of investigations. Interpretation of laboratory results; preparing protocol from the examined clinical case, discussing other cases. The protocol stands for 25% of final grade.			
<b>Assessment methods:</b>	<p>Students taking part in this elective are evaluated basing on their attendance during classes; (1 absence = 3 hours is allowed (20% of the course), and results from the completed protocol of the clinical case they work with and results from written assessment test. Those students who have not fulfilled the requirement of attendance are not allowed for written test.</p> <p>The protocols from the examined cases are prepared individually.</p> <p>There will be one, written test, 45 minutes, consisting of 6 open questions - at the end of practical course. One answer/question is worth 2 points (12 points total).</p> <p>There will one, written retake at the end of the course. The retake consists of 6 questions (12 points in total). The minimum to pass the test and also the retake is 7.5 points.</p> <p>In case of unforeseen, unusual circumstances mandatory remote teaching and remote assessment methods might be adopted.</p>			
<b>Detail description of assessment methods;</b>	No extra assessment methods are anticipated.			
<b>Formal documentation of learning outcome:</b>	e-HMS entry. Records collected in the course portfolio i.e. individual records of student results, presence lists, database of oral and written questions, written assessments of the students.			
<b>Elements impelling final grade:</b>	<p>Program of the Module is enclosed.</p> <p>Protocol of the microbiological diagnostic steps performed to isolate and identify the agents (organisms) in the examined clinical specimen – presented on the last class, graded 2 to 5 points.</p> <p>There will be one, written test, 45 minutes, consisting of 6 open questions at the end of practical course. One answer/question is worth 2 points (12 points total).</p> <p><b>Grading:</b>  7.0p and less = negative result – 2  7.5-8.0p = 3  8.5-9.0p = 3.5  9.5-10.0 = 4  10.5-11 = 4.5  11.5-12 = 5</p> <p>There will be one, written retake at the end of the course. The retake consists of 6 questions (12 points in total). The minimum to pass the test and also the retake is 7.5 points.</p> <p>Students who have started this module and the required number of attendance, who have presented correct protocol from laboratory examinations of the clinical specimen and have obtained 7.5 or more points from the written evaluation test obtain ultimate positive grade</p> <p>Students who have not passed written test in the first term and have not attended the retake are given unsatisfactory grade</p> <p>Those students who have not passed written test in two terms are given unsatisfactory grade – they can repeat the Elective in subsequent year.</p>			
<b>Teaching base:</b>	Laboratories in the Department of Preclinical Sciences IVM.			

**Mandatory and supportive materials :**

There are many reference books that may be helpful as supplemental material to laboratory exercises. A wide variety of general, applied health and health professional microbiology textbooks are available in the Faculty and University libraries. Various veterinary medical textbooks have large sections devoted to infectious diseases. Within these discussions, disease, ecology, pathogenic mechanisms and other characteristics of agents are frequently reviewed. The lecture of above mentioned texts is recommended in order to improve microbiological knowledge.

**The following microbiology textbooks are indicated for further reading:**

1. Veterinary Microbiology and Microbial Disease. Quinn P.J., Markey B.K., et al. Blackwell Publishing, 2002.
2. Veterinary microbiology: bacterial and fungal agents of animal disease. Songer G.J., Post K.W., Elsevier, 2005.
3. Veterinary Mycology. Indranil S., Springer, 2015.
4. BSAVA Manual of Canine and Feline Dermatology. Jackson H., Marsella R. John Wiley and Sons, ISBN: 9781910443804
5. Skin Diseases of the Dog and Cat, Heinrichs N. et al. Taylor & Francis Ltd 2018 (Third Edition)
6. Diagnosis and treatment of dermatophytosis in dogs and cats. Moriello K., Coyner K., Peterson S., Mignon B.; Vet. Dermatol. 2017, 28, 266.

Also read current veterinary journals as: In Practice, Vet Rec, Today Vet Practice.

Relevant scientific publications including those of the module coordinator.

**ANNOTATIONS**

Comply with Health and Safety rules, protective clothing is obligatory, disposable gloves and protective mask.

\* 3 – complete and detailed, 2 – moderate, 1 – basic.

Quantitative summary of the module:

Estimated number of work hours per student (contact and self-study) essential to achieve presumed learning outcomes of the module - base for quantifying ECTS: there are 15 hours of practicals in contact and 15 hours for self study	<b>30 h</b>
Total ECTS points, accumulated by students during contact learning:	<b>1 ECTS</b>

**Elective Coordinator**

**/Ada Schollenberger DVM, PhD/**