SEMESTER STUDY PLAN

Diagnostic Laboratory (FKH 1505) 2(0-2)

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Course Coordinator

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SCHOOL OF VETERINARY MEDICINE AND BIOMEDICAL SCIENCES
IPB UNIVERSITY
2022

A. COURSE IDENTITY

Course Name	**:**	**Laboratorium Diagnostik**
Course Code	**:**	FKH1505
Prerequisite	**:**	-
Semester Credit Hours	**:**	4(0-4)
Course Description	**:**	This course teaches Veterinary Professional Education (VPE) students to obtain, accept, handle, store, and examine samples from animals; read, interpret, determine, and report the results of laboratory examinations (microbiology, parasitology, and immunology); destruction of samples properly and correctly, and suggestions animal disease control and control actions
Course Status	**:**	Compulsory Study Program
Number of Parallel Course	**:**	Five
Course Coordinator	**:**	Drh. Usamah Afiff M.Sc
Mobile Contact of Course Coordinator	**:**	081295501060
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B. THE CONTRIBUTION OF COURSE TO STUDY PROGRAMME LEARNING OUTCOME

This course contributes to the learning achievements of the Study Program/Essential Learning Outcomes (ELOS) as follows:

ELO	**After completing the compulsory study program, students can:**	**CL**
BLO 1	Establish the diagnosis of various animal diseases and take medical actions based on clinical diagnostic practices and clinical diagnostic laboratories in full and accurately from each individual or group	CLO4
BLO 2	carry out reproductive medical measures, which include pregnancy examination, midwifery, handling reproductive disorders, and artificial insemination applications.	CLO2 dan CLO4
BLO 3	Using electro radiographic and ultrasonic equipment to determine diagnoses safely and accurately following standard procedures.	CLO2
BLO 4	Handling health problems of all animal species in an emergency and can do first aid.	CLO4

BLO 5	Handling and controlling animals safely following animal welfare rules.	CLO4
BLO 6	Assessing the nutritional status of animals (body scoring condition), compiling formulations of rational economic feed rations and dietetic nutrition for health recovery.	CLO4
BLO 7	Make a prescription for drug preparations and approve drug use/use appropriately, ensure the proper and correct management of drugs and waste, and be responsible for following applicable regulations.	CLO1 dan CLO3
BLO 8	Apply the principle of surgical equipment sterilization and aseptic surgery to minimize the risk of contamination (nosocomial infection).	CLO2
BLO 9	Perform operational action with the correct steps, including sedation, general and regional anaesthesia, and pain management safely, and assess and control the actions taken.	CLO4
BLO 10	Collect, store and send samples according to the required data analysis, perform standard laboratory tests, and interpret the results of complete laboratory examinations.	CLO2
BLO 11	Decide on euthanasia using the proper method based on fundamental reasons and the principles of animal welfare and extermination according to the procedure.	CLO1 dan CLO4
BLO 12	Conduct ante- and post-mortem examinations of animals and identify conditions that may affect the quality and safety of animal products to guarantee public health	CLO3
BLO 13	Perform risk analysis on animal disease, animal product safety and quality assurance, as well as veterinary economic analysis	CLO3
BLO 14	Prepare detailed case reports, including actions taken and maintain medical records	CLO2
BLO 15	Communicate effectively with clients and the public by giving informed consent on the medical action	CLO2
M 1	determine and provide advice on the implementation of animal disease prevention and control programs	CLO4
M 2	perform veterinary medical procedures in lege artistic manner	CLO4
M 3	work independently or in groups in animal and zoonotic health services and veterinary public health.	CLO4
M 4	act medically professionally and based on veterinary legislation and apply the code of ethics for Indonesian Veterinarians	CLO2

Keterangan:
ELO = Essential learning outcome
BLO = Learning Outcome of Veterinary Professional Education Program
M1 = Managerial Learning Outcome of Veterinary Professional Education Program
CL = Competency level

Criteria of competency level:
C1 = Thought process memory; C2 = understanding thinking process; C3 = Application thinking process; C4 = Analysis thinking process; C5 = Synthesis thinking process, C6 = Evaluation thinking process

Cara Pengisian:
1. BLO is the Learning outcome of the Veterinary Professional Education Program study program (already standard)
2. CL is filled according to the competency level of the course in each ELO component

C. (Course LearningOutcomes/CLO)

CLO	After completing this course, the expectations are:	CL
CLO2	Students can take, receive, handle, store, and examine samples of animal origin	C4
CLO2	Students can examine specimens of animal origin to determine microorganisms that cause animal disease	C5
CLO2	Students can examine specimens of animal origin to determine parasites that cause disease in animals and collect and identify disease vectors	C5
CLO4	students can compose scientific writing with topics related to the laboratory diagnosis of diseases caused by microorganisms and parasites and the role of disease vectors	C6

Note: CLO= Course learning outcome
CL = Competency level

D. COURSE METHOD (Problem-based learning)

Learning activities begin with an explanation of course construction, the learning process and learning activities that students will participate in, the division of groups, descriptions of assignments, rules of conduct, and lecture contracts and assessment procedures. Learning activities/meetings last for 4 (four) weeks. Students are divided into two groups. The first group participates in practical activities in the microbiology laboratory and the second in the parasitology laboratory for two weeks, and then after two weeks, the groups switch laboratories. At the end of the activity, an examination is carried out in each laboratory. Students are asked to conduct a presentation/seminar on cases found and methods for controlling diseases caused by microorganism/parasite infections.

E. TEACHING MATERIALS

1. Adam, KM., GJ. Paul and V. Zaman. 1971. *Medical and Veterinary Protozoology*. Edinburg and London (UK): Churchill Livingstone.
2. Ashadi G, Partosoedjono. 1992. *Penuntun Laboratorium Parasitologi I*. Bogor (ID): Pusat Antar Universitas-Institut Pertanian Bogor.
3. Bowman DD. 2009. *Georgis' Parasitology for Veterinarians* (*9th Ed*). Elsevier.
4. Carter GR, Chengapa MM, Roberts AW. 1995. *Essentials of Veterinary Microbiology*. Baltimore (US): Williams & Wilkins.
5. Carter GR Cole JR. 1990. *Diagnostic Procedures in Veterinary Bacteriology and Mycology*. San Diego (US): Academic Press, Inc.
6. Kwon-Chung KJ, Bennet JE. 1992. *Medical Mycology*. Philadelphia (US): Lea and Febiger.
7. Paricia M. Tille 2014 Bailey and Scott's: Diagnostic Microbiology. 13th Edition. Elsevier
8. Quinn PJ, Carter ME, Donnelly WJ, Leonard FC. 2001. *Veterinary Microbiology and Microbial Diseases*. Oxford (UK): Oxford University Press.
9. Salyer AA, Whitt DD. 1994. *Bacterial Pathogenesis, A Molecular Approach.* Washington DC (US): AsmPress.
10. Soulsby EJL.1986. *Helminths, Arthropods, and Protozoa of Domesticated Animals*. London (UK): Bailliere Tindall.
11. Symon LEA. 1989. *Pathophysiology of Endoparasitic Infection, Compared with Ectoparasitic infestation and Microbial Infection*. Academic Press Australia.
12. Tortora, G.J. dan B. R. Funke. 2016. *Microbiology, an Introduction 12th Ed.* Menlo Park (US): Benjamin/Cummings Publishing Company.

F. SEMESTER COURSE PLAN

Topic	ELO	CLO	COURSE TOPIC(S)	COURSE METHOD(S)	SCORING CRITERIA (INDICATOR(S))	SCORE PERCENTAGE
1	BLO1, BLO5, BLO10, M2	Students can determine, collect, receive, handle, and store samples of animal origin suspected of having an infectious disease for microbiological examination.	Explanation of the theory of sampling of animal origin for microbiology and parasitology. Explanation of the theory of microbiological, parasitological, and clinical pathology examination on samples of animal origin. Explanation of the basic techniques of laboratory diagnostic equipment instrumentation. Explanation of procedures for sending samples for further examination	Lecturer explanation with photo illustrations and multimedia, and through discussion	Correct determination of samples for microbiological examination	10%
2-6	BLO10,	Students can perform laboratory diagnostic techniques to isolate disease agents caused by bacterial, fungal, and viral infections • Students can diagnose and report animal diseases caused by bacteria, fungi, and viruses	Determination and sampling Delivery of samples Sample preparation Isolation of bacteria on suitable media Isolation of virus in germinated eggs HA/HI test, SNT test ELISA demo/discussion PCR Describe the interpretation of results and the optimization of diagnostic laboratory techniques for confirming the diagnosis of infectious diseases Explain the method of concluding to make the principal diagnosis, including the differential diagnosis Explanation of procedures for preparing and writing reports on the results of laboratory	Lecturer's explanation with illustrations and photos Discussion of laboratory diagnostic results associated with the latest diagnostic techniques. Discussion of laboratory diagnostic results related to the disease case	Correct agent identification	30%

Topic	ELO	CLO	COURSE TOPIC(S)	COURSE METHOD(S)	SCORING CRITERIA (INDICATOR(S))	SCORE PERCENTAGE
			diagnostic examinations Explanation of procedures for recording cases and documentation			
7	BLO14,M1	Students can make diagnoses and report animal diseases caused by bacteria and viruses	Explanation of procedures for recording cases and documentation Seminar on topics found and parasite control methods	Lecturer's explanation	Correctness of final diagnosis	10%
8	BLO1, BLO10, M2	Students can collect, receive, handle, store, examine, and samples of animal origin for parasitological examination	Explanation of the theory of sampling of animal origin for parasitology (faeces, skin scrapings, and blood) and vector collection procedures	Lecturer's explanation with photo illustrations, multimedia, and discussions	Correctness of parasitological sample examination	10%
9-11	BLO10	Stool examination techniques and interpretation of results.	• Qualitative stool examination (native, flotation, and sedimentation) • Eosin stain, Lugol stain • Quantitative stool examination using the McMaster method • Oocyst sporulation • Fertilization of L3 Nematodes	• Lecturer's explanation with illustrations and photos • Discussion of laboratory diagnostic results associated with the latest diagnostic techniques. • Discussion of laboratory diagnostic results related to the disease	The correctness of examination of stool samples for the diagnosis of endoparasites	20%
12-14	BLO10, BLO14, M1	• Students can explain and conclude about specimen examination techniques of the organs and make reports on animal diseases caused by parasites	• Native blood test • Examination of blood smear with Giemsa stain, • Examination of blood samples using the Knott test method • *Dirofilaria immitis* antigen test demo with the kit • Analysis of skin scraping specimens for the study of scabies and Demodex mites • Collection, preservation, and	• Lecturer's explanation with illustrations and photos • Discussion of laboratory diagnostic results associated with the latest diagnostic techniques. • Discussion of laboratory	Confirmation of the diagnosis of examination of blood parasite samples and investigation of ectoparasites samples	20%

Topic	ELO	CLO	COURSE TOPIC(S)	COURSE METHOD(S)	SCORING CRITERIA (INDICATOR(S))	SCORE PERCENTAGE
			identification of ectoparasites, e.g., fleas, ticks, mosquitoes, ticks, flies, and myiasis • Control of ectoparasites by spraying insecticides • Seminar on cases found and parasite control methods	diagnostic results related to the disease case		

G. PLAN OF PROBLEM-BASED LEARNING (PBL)

Activities in the diagnostic laboratory begin with the lecturer explaining course construction, the learning process and activities that students will follow, and the division of student groups. Each group was assigned to look for cases of disease caused by microorganisms and parasite infections and to take specimens/samples to isolate and identify the causative agents. At the end of the laboratory activity, each group must present the results of their laboratory work.

The Role of Lecturers and Students in Case Study/PBL

The Role of The Lecturers	The Role of The Students
1. The lecturer forms groups (2-4 people per group) randomly by taking into account gender distribution (maximum total of 5 groups in each parallel class) 2. Lecturers guide cases of acquired disease and procedures for laboratory examination 3. Lecturers provide feedback on results, papers, and oral presentations and provide corrections if there is a mistake in the substance being discussed	1. Students in groups discuss to find and determine cases for sample material for examination in the laboratory 2. Students deepen the samples examined 3. Students carry out laboratory tests to determine the identity of the disease-causing agent 4. Students compile reports/papers and presentation materials (ppt) that can answer the expected output.

H. ASSESSMENT OF LEARNING OUTCOME

1. The final score of the Veterinary Professional Education (VPE) Program activities in the Diagnostic Laboratory field is determined from the components of the assessment as follows:
   a. Regular attendance (100% mandatory) 10%
   b. Daily quizzes/discussions 15%
   c. Final case report and Examination 50%
   d. Paper writing and presentation 25%

2. Determination of the quality value of Veterinary Professional Education (VPE) Program activities in the Diagnostic Laboratory field is carried out based on the achievement standards for the total final Score as follows:

Final Score Range	Final Score in Letter	GPA
Final Score > 75.0	A	4.0
70.0 < Final Score ≤ 75	AB	3.5
65.0 < Final Score ≤ 70.0	B	3.0
55.0 < Final Score ≤ 65.0	BC	2.5
50.0 < Final Score ≤ 55.0	C	2.0

PAPER/REPORT ASSESSMENT FORM
Diagnostic Laboratory

Date : _____
Group : _____
Group Member : 1._____(NIM:_____)

2._____(NIM:_____)

3._____(NIM:_____)

4._____(NIM:_____)

Paper Assessment (Score Range: 60-100; grading scale range 5)

Assessment Aspects	Expected (Maximum Score 100)	Weight (B)	Score (N)	B*N
Case Title	Cases that become group assignments are appropriate.	5%		
Specimen	According to the problem/case	15%		
Cultural media and colony characteristics	according to the problem	20%		
Testing for Identification	according to the problem	20%		
Cellular Products that play a role in causing infection/intoxication	according to the problem	10%		
Control	according to the problem	20%		
Bibliography	More than five references	10%		
Total	**100%**			

Oral Presentation Assessment (Score Range: 60-100, rating scale range 5)

Assessment Aspects	**Yang Diharapkan (Nilai Maksimum 100)**	**Weight (B)**	**Score (N)**	**B*N**
The clarity of the material presented.	The contents of the presentation material are systematic; the information is correct/accountable and clear and relevant to the paper.	15%		
PowerPoint quality	Applying the VISUALS principle (visible, interesting, structured, useful, accurate, legitimate, simple) and free from plagiarism	20%		
Ability to deliver material orally	Presentation material delivered in a systematic, straightforward manner, with clear intonation, full of confidence, and interesting for the audience to listen to; conclusions answer all the goals formulated; presentation timeliness.	30%		
Ability to answer/respond to questions	All questions are listened to and responded to based on valid information/based on references.	20%		
Role of group members	All group members play a role during the presentation and discussion sessions.	15%		
Total		**100%**		