

Course Specification

Name of Institution Mahidol University
 Campus/Faculty/Department Faculty of Veterinary Science

Section 1 General Information

1. Course Code and Title

VSPA 716 Advanced Clinical Bacteriology and Mycology in Veterinary Science
 สพปส 716 วิทยาแบคทีเรียคลินิกและวิทยาเชื้อราคลินิกทางการสัตวแพทย์ชั้นสูง

2. Number of Credits

3 (2-3-5) Credits (lecture – laboratory – self-study)

3. Curriculum and Course Type

Program of Study Master of Science Program in Veterinary Biomedical Sciences
 Course Type Core Required Electives

4. Faculty Member in Charge of this Course and Advisor of Internship

4.1 Faculty Member in Charge of this Course

Name Assist.Prof.Norasuthi Bangphoomi
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4.2 Lecturers

1. Name Dr.Krudsada Chaichoun (KC)
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2. Name Dr.Dulyatad Gronsang (DG)
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3. Name Assist.Prof.Natharin Ngamwongsatit (NN)
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4. Name Assist.Prof.Norasuthi Bangphoomi (NB)
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5. Name Assist.Prof.Nathita Phumthanakorn (NP)
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5. Semester/The training experience required in the curriculum

Semester 2 / Class Level or year 1

6. Pre-requisite

none

7. Co-requisite

none

8. Venue of Study

Faculty of Veterinary Science, Mahidol University

9. Date of Latest Revision

2 January 2024

Section 2 Goals and Objectives

1. Course Goals

This course aims to provide knowledge and abilities as follows:

- 1) Understanding and able to discuss advanced knowledge of veterinary microbiology from academic journal
- 2) Understanding and able to discuss advanced knowledge of veterinary microbiology from academic journal
- 3) Become proficient in microbiological skills
- 4) Understanding and able to discuss advanced knowledge of veterinary microbiology and mycology from practical approach

2. Objectives of Course Development/Revision Field Experience Course

Update the curriculum to raise student achievement

3. Course-level Learning Outcomes: CLOs

This course aims to provide knowledge and abilities as follows:

- 1) CLO1 Understanding and able to discuss advanced knowledge of veterinary microbiology and mycology from academic journal
- 2) CLO2 Understanding and able to discuss advanced knowledge of clinical microbiology and mycology as it relates to veterinary medicine
- 3) CLO3 Become proficient in microbiological skills
- 4) CLO4 Understanding and able to discuss advanced knowledge of veterinary microbiology and mycology from practical approach

Section 3 Course Management

1. Course Description

VSPA 716 Advanced Clinical Bacteriology and Mycology in Veterinary Science

สปส 716 วิทยาแบคทีเรียคลินิกและวิทยาเชื้อราคลินิกทางการสัตวแพทย์ชั้นสูง

2. Credit Hours per Semester

Lecture	2	Hour
Laboratory/Field Trip/Internship		Hour
Laboratory	3	Hour
Self Study	5	Hour

3. Number of hours that lecturers provide counseling and guidance to individual student

3

Section 4 Development of Students' Learning Outcome

1. A brief summary of the knowledge or skills expected to develop in students; the course-level expected learning outcomes (CLOs) On completion of the course, students will be able to:

1. CLO1 Understanding and able to discuss advanced knowledge of veterinary microbiology from academic journal
2. CLO2 Understanding and able to discuss advanced knowledge of veterinary mycology from academic journal
3. CLO3 Become proficient in microbiological skills
4. CLO4 Understanding and able to discuss advanced knowledge of veterinary microbiology and mycology from practical approach

2. How to organize learning experiences to develop the knowledge or skills stated in number 1 and how to measure the learning outcomes

CLOs	Teaching and learning experience management		Learning outcomes measurements		
	Lecture	group work	MCQ and short answer	Group reports	Group presentation
CLO1	X	X			X
CLO2	X	X		X	X
CLO3	X	X		X	X
CLO4	X	X		X	X

Section 5 Teaching and Evaluation Plans

1. Teaching Plan

Week or No.	Topic	Hours			Teaching Methods / Media	CLOs	Lecturers
		Lecture	Laboratory	Self Study			

1	The 2023 WHO fungal priority pathogens list Point of care tests for invasive fungal infections	2	3	5	- Discussion - Assignment - Practice	2,3,4	Staff
2	Molecular surveillance in fungal infections Molecular Identification of Fungi I	2	3	5	- Discussion - Assignment - Practice	2,3,4	Staff
3	Fungi genetics: Fungiomics Molecular Identification of Fungi II	2	3	5	- Discussion - Assignment - Practice	2,3,4	Staff
4	Antifungal resistance mechanisms Antifungal susceptibility test (AFST)	2	3	5	- Discussion - Assignment - Practice	2,3,4	Staff
5	Trend in clinical mycology: fungal extracellular vesicles Next-Generation Sequencing	2	3	5	- Discussion - Assignment - Practice	2,3,4	Staff
6	Bacterial resistance mechanisms to Antibiotics Multitest strip	2	3	5	- Discussion - Assignment - Practice	1,3,4	Staff
7	Bacterial Secretion Systems PCR detection of Bacteria	2	3	5	- Discussion - Assignment - Practice	1,3,4	Staff
8	Bacterial Toxins AST for Bacteria	2	3	5	- Discussion - Assignment - Practice	1,3,4	Staff
9	Advances in bacterial genomics Vitek system	2	3	5	- Discussion - Assignment - Practice	1,3,4	Staff
10	Host response to bacterial infection Horizontal gene transfer assay (conjugation assay)	2	3	5	- Discussion - Assignment - Practice	1,3,4	Staff
11	Biofilm-related infection Biofilm detection assay	2	3	5	- Discussion - Assignment - Practice	1,3,4	Staff
12	Bacterial Vaccines Subtyping techniques 1 (PFGE)	2	3	5	- Discussion - Assignment - Practice	1,3,4	Staff

13	Epidemiological Investigation of Bacterial Diseases Subtyping techniques 2 (MLST)	2	3	5	- Discussion - Assignment - Practice	1,3,4	Staff
14	Current topics in Gram positive infection Whole genome analysis 1	2	3	5	- Discussion - Assignment - Practice	1,3,4	Staff
15	Current topics in Gram negative infection Whole genome analysis 2	2	3	5	- Discussion - Assignment - Practice	1,3,4	Staff
รวมจำนวนชั่วโมงตลอดภาคการศึกษา		30	45	75			

2. Evaluation Plan

Learning Outcomes	Evaluation Method			Weight (Percentage)
	presentation	Answering and discussion	Class attention	
CLO1 Understanding and able to discuss advanced knowledge of veterinary microbiology from academic journal	15	30	5	50
CLO2 Understanding and able to discuss advanced knowledge of veterinary mycology from academic journal	7.5	15	2.5	25
CLO3 Become proficient in microbiological skills		-	15	15
CLO4 Understanding and	-	10		10

Learning Outcomes	Evaluation Method			Weight (Percentage)
	presentation	Answering and discussion	Class attention	
able to discuss advanced knowledge of veterinary microbiology and mycology from practical approach				
Total	22.5	55	22.5	100

Note*

1. Show the methods/tools and weight for measuring and evaluating each CLO.
2. Total the weight from every tool and CLO to 100
3. Verify the information to be consistent with the evaluation methods shown in Section 4 Table.

3. Measurement and evaluation

The assessment is performed during the course to measure the progress and development of students' learning by observing the behavior change and improvement of students' behavior and performance. The assessment results will be notified to the students (feedback) so that the students are constantly able to improve themselves. The assessment results are not included with the test scores at the end of the course.

4. Students' Appeal

Should the students have any suspicion or appeals to the teaching and learning activities and the grade assessment, students could make the appeal by filling in the form at MUVS' Academic Affairs. The appeal will be proposed to the course coordinator to consider the request. If the appeal could not be addressed at this point, it will be further process by the program's Teaching and Learning Development Committee. In case that the committee suggested further investigation should be done, the appeal will be purposed to the faculty's appealing committee to address the issue.

Section 6 Teaching Materials and Resources

1. Textbooks and Main Documents

D. Scott McVey (Editor), Melissa Kennedy (Editor), M. M. Chengappa (Editor), Rebecca Wilkes (Editor), Veterinary Microbiology, 4th Edition, Wiley, 2022

2. Documents and Important Information

Pubmed, Science Direct, Google Scholar

3. Documents and Recommended Information

Pubmed, Science Direct, Google Scholar, MU library website

Section 7 Evaluation and Improvement of Course Management

1. Strategies for Evaluation of Course Effectiveness by Students

At the end of each course, it is required for the students to assess the teaching of each instructor based on the following criteria: punctuality, good role model, application of morals and ethics for the instruction, ability to convey knowledge and encourage students to learn, giving opportunities for students to ask questions and to comment during the study.

The overall outcomes of each course will also be assessed by the students for the following issues: the instructor's knowledge and competency, the course's effectiveness, student's satisfaction with the study, and other comments from students. The evaluation is conducted through online platform.

2. Strategies for Evaluation of Teaching Methods

The instructors or the course coordinators are assigned to conduct the evaluation as follows.

2.1 the students' evaluation for the instruction and overall outcomes of the course in accordance to criteria mentioned in No. 1 – Strategy for Course Effectiveness by Students.

2.2 The instructors must perform self-assessment for the following criteria.

- (1) Appropriate time spent to prepare for the teaching.
- (2) The instructor's satisfaction with the teaching results.
- (3) Solutions or recommendations for the program's teaching improvement or self-improvement for the next class/academic year.

3. Improvement of Teaching Methods

Prior to each academic year, there are meetings/seminars for the instructors of each course to plan to improve the course's teaching and learning management based on the following information.

- (1) the students' academic performance
- (2) the students' evaluation results
- (3) the instructors' assessment results

4. Verification of Students' Learning Outcome

The verification of the standard of the Learning Outcome for the Course is conducted by the course coordinators based on the following aspects.

- (1) The goals of the learning outcomes are clear and feasible.
- (2) The learning experience is aligned with the expected goals.
- (3) The learning experience encourages the students to research and practice self-learning skills.
- (4) The evaluation methods are appropriate to assess the expected goals and learning experience.
- (5) The program applied the educational theory and the results from the previous evaluation to plan for improvement.

At the end of each academic year, the course coordinators, instructors, the Program Committee, and the Teaching and Learning Development Committee will consider the assessment results and the Learning Outcome for the Course to plan for the improvement of the next academic year.

5. Review and Plan to Improve Course Effectiveness

After the course evaluation and verification, the course effectiveness will be improved through the following:

- (1) The course is revised every 3 years according to the evaluation and verification.
- (2) Rotation or changing of instructors so students get different research points of view.

Appendix

Relations between the course and the program

Table 1 Relations between the course and the PLOs

	PLOs					
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
VSPA 716/Advanced Clinical Bacteriology and Mycology in Veterinary Science/ 3 (2-3-5)	M	M	M	P	P	P

I (introduced), R (reinforced), P (practiced), M (Mastery)

Program Learning Outcomes (TQF.2)

PLO 1 Manage ethical and moral problems in field practice with evidence-base approaches and leadership together with appropriate logic and value.

PLO 2 Prioritize scientific information in biomedical veterinary science and apply the beneficial output to develop laboratory practice and research study.

PLO 3 Integrate the theory and experiences together with scientific evidences to develop the new knowledge in veterinary science through research study.

PLO 4 Communicate efficiently with multidisciplinary academic colleagues and staff by using the communicate appropriately with the individual groups, both in academic and professional

PLO 5 Utilize digital and information technology (IT) to encourage working network communication, data analysis together with presentation and research publication.

PLO 6 Evaluate principles, purposes, strong critical-thinking with problem-solving skills, to utilizing veterinary science literacy as integral part of the thought process.

Table 2 Relations between CLOs and PLOs

CLOs	PLOs					
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1 Understanding and able to discuss advanced knowledge of veterinary microbiology from academic journal		M	M	P	P	P
CLO2 Understanding and able to discuss	P	M	M	P	P	P

advanced knowledge of veterinary mycology from academic journal						
CLO3 Become proficient in microbiological skills		M	M	P	P	P
CLO4 Understanding and able to discuss advanced knowledge of veterinary microbiology and mycology from practical approach	P	M	M	P	P	P

I (introduced), R (reinforced), P (practiced), M (Mastery)

Course schedule

Week or No.	Date	Time	Teaching Methods /Media	Topic	Lecturers
1	17/1/2024	10.00-12.00	Lecture	Bacterial resistance mechanisms to Antibiotics	NP and staff
	19/1/2024	13.00-16.00	Lab	Horizontal gene transfer assay (conjugation assay) Biofilm detection assay	NP and staff
2	24/1/2024	10.00-12.00	Lecture	Subtyping techniques 1 (PFGE) Subtyping techniques 2 (MLST) Epidemiological Investigation of Bacterial Diseases	NP and staff
	26/1/2024	13.00-16.00	Lab	Whole genome analysis 1 Whole genome analysis 2	NP and staff
3	31/1/2024	10.00-12.00	Lecture	Host response to bacterial infection	DG and staff
	2/2/2024	13.00-16.00	Lab	Identification of bacterial pathogens (Conventional, Strip and VITEK)	NN and staff
4	7/2/2024	10.00-12.00	Lecture	Biofilm-related infection	DG and staff
	9/2/2024	13.00-16.00	Lab	Assignment 1	NB and staff
5	14/2/2024	10.00-12.00	Lecture	Bacterial Vaccines	DG and staff
	16/2/2024	13.00-16.00	Lecture	Current topics in Gram positive infection	DG and staff
6	21/2/2024	10.00-12.00	Lecture	Current topics in Gram negative infection	DG and staff

	23/2/2024	13.00-16.00	Lab	Assignment 2	NB and staff
7	28/2/2024	10.00-12.00	Lecture	Bacterial pathogens in animal and Approaches to study bacterial pathogenesis	NN and staff
	1/3/2024	13.00-16.00	Lab	Molecular based method for bacterial identification	NN and staff
8	6/3/2024	10.00-12.00	Lecture	Antimicrobial resistance (AMR)	NN and staff
	8/3/2024	13.00-16.00	Lecture	Assignment 3	NB and staff
9	13/3/2024	10.00-13.00	Lab	AST for Bacteria (VITEK and MedFluid)	NN and staff
	15/3/2024	13.00-16.00	Lab	Assignment 4	NB and staff
10	20/3/2024	10.00-13.00	Lab	Modern Tools for Rapid Diagnostics of Antimicrobial Resistance	NN and staff
	22/3/2024	13.00-16.00	Lab	Assignment 5	NB and staff
11	27/3/2024	10.00-12.00	Lecture	The 2023 WHO fungal priority pathogens list	NB and staff
	29/3/2024	13.00-16.00	Lab	Point of care tests for invasive fungal infections	NB and staff
12	3/4/2024	10.00-12.00	Lecture	Molecular surveillance in fungal infections	NB and staff
	5/4/2024	13.00-16.00	Lab	Molecular Identification of Fungi I	NB and staff
13	10/4/2024	10.00-12.00	Lecture	Fungi genetics: Fungiomics	NB and staff
	12/4/2024	13.00-16.00	Lab	Molecular Identification of Fungi II	NB and staff
14	24/4/2024	10.00-12.00	Lecture	Antifungal resistance mechanisms	NB and staff
	26/4/2024	13.00-16.00	Lab	Antifungal susceptibility test (AFST)	NB and staff
15	1/5/2024	10.00-12.00	Lecture	Trend in clinical mycology: fungal extracellular vesicles	NB and staff
	3/5/2024	13.00-16.00	Lab	Next-Generation Sequencing	NB and staff