



Program: Doctor of Veterinary Medicine
Course title: Veterinary Microbiology
Course code: VSPA 333

Academic degree level ☒ Bachelor ☐ Graduate Diploma ☐ Master
☐ Higher Graduate Diploma ☐ Doctor
Faculty / College / Institute: Faculty of Veterinary Science
Department Pre-Clinic and Applied Animal Science..

TQF 3 Course Specification

Section 1 General Information

1. Course Code and Title

In Thai: สปส ๓๓๓ จุฬชีววิทยาทางการสัตวแพทย์
In English: VSPA 333 Veterinary Microbiology

2. Number of Credits

4 (4-0-8)
(Theory 4 hrs. Practice 0 hrs. Self-Study 8 hrs./week)

3. Curriculum and Course Type

3.1 Curriculum: Bachelor Degree Program (Thai)
3.2 Course Type: Specific Course ☒ Compulsory Course ☐ Electives

4. Course Coordinator and Lecturer

4.1 Course Responsible Lecturers :

4.1.1 Lecturer Kridsada Chaichoun, D.V.M., M.Sc., Ph.D., DTBVP.
Department of Pre-clinic and Applied Animal Science
Contact: 02-4415242 Ext.1514 e-mail address: kridsada.cha@mahidol.edu

4.1.2 Lecturer Nathita Phumthanakorn, D.V.M., Ph.D.
Department of Pre-clinic and Applied Animal Science
Contact: 02-4415242 Ext.1544 e-mail address: nathita.phu@mahidol.edu

4.2 Lecturers :

4.2.1 Lecturer Kridsada Chaichoun, D.V.M., M.Sc., Ph.D., DTBVP.
Department of Pre-clinic and Applied Animal Science
Contact: 02-4415242 Ext.1514 e-mail address: kridsada.cha@mahidol.edu

4.2.2 Associate Professor Wittawat Wiriyarat, D.V.M., Ph.D.
Department of Pre-clinic and Applied Animal Science
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4.2.3 Lecturer Dulyatad Gronsang, D.V.M., M.Sc., Ph.D.
Department of Pre-clinic and Applied Animal Science
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4.2.4 Assistant Professor Norasuthi Bangphoomi, D.V.M., M.Sc., Ph.D.

Department of Pre-clinic and Applied Animal Science

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4.2.5 Lecturer Nathita Phumthanakorn, D.V.M., Ph.D.

Department of Pre-clinic and Applied Animal Science

Contact: 02-4415242 Ext.1544 e-mail address: nathita.phun@mahidol.edu

5. Semester/Class Level

5.1 Semester 1 / Class Level Year 3

5.2 Number of Students Allowed Approximately 80 Students

6. Pre-requisite

SCBI 123 Process of Life

7. Co-requisites

7.1 VSPA331 Veterinary Immunology

7.2 VSPA332 Laboratory of Veterinary Microbiology and Immunology

8. Study Site Location Faculty of Veterinary Science, Mahidol University

9. Date of Preparation/Latest Revision of the Course Specifications

2 March 2020

Section 2 Aims and Objectives

1. Course Goals

Providing learning experiences for students to have the understanding in bacteria, viruses and fungi of veterinary importance both in terms of basic knowledge of microorganisms, including of pathogenesis, disease prevention collecting samples and being able to apply the knowledge learned to be useful in clinical practice and working in the future

Objectives /Goals of Course Management:

2. Objectives of Course Development/Revision

2.1 Course Objectives

This course aims to provide knowledge and abilities as follows:

- 1.1.1 Explain the type, shape, characteristic, transmission, and classification of pathogenic microorganisms. Understand of the pathogenesis of bacterial, fungal and viral infectious diseases in animals and those related to public health.
- 1.1.2 Describe the types of pathogenic bacteria which infect to various organ systems of animals, including the gastrointestinal tract, respiratory system, urinary system, reproductive system, and circulatory system
- 1.1.3 Describe types of the pathogenic superficial infected fungi, opportunistic fungi including to mycotoxins that can affect animal health.
- 1.1.4 Describe the types and pathogenesis of animal viruses in various animals: cattle, buffaloes, goats, sheep, pigs, domestic animals (dogs, cats, horses), poultry (chickens, ducks), wild animals, aquatic animals and exotic pets.
- 1.1.5 Describe methodology of disease diagnosis, procedures of sterile technique to avoid microbial contamination, procedures to collect and send clinical specimens for laboratory culture

2.2 Course-level Learning Outcomes: CLOs

On completion of the course, the students will be able to:-

1. CLO1 : Describe the causes of bacterial, fungal and viral infections, as well as describe the pathogenesis, clinical signs, diagnosis and treatment of diseases that are common problems in domesticated animals in Thailand according to Thailand Veterinary Professional Standards B.E. 2553, item 16 (1-5).
2. CLO2 : Assess the risk of epizootic pathogens and zoonotic pathogens that are caused by bacteria, fungi and viruses, and plan disease prevention to pathogens complied with the Veterinary Professional Standards B.E. 2553, item 16(1-5), 20 and 21(4).
3. CLO3 : Ethical check themselves and be willing to let others check for the benefit of improving the efficiency of animal health care and public health to meet the criteria of the veterinary profession B.E. 2553, item 4.
4. CLO4 : Self-searching the up-to-date information in microbiology that represents lifelong learning

Section 3 Course Description and Implementation

1. Course Description

การจำแนกชนิด สัตว์ฐานวิทยา โครงสร้าง คุณสมบัติทางชีวเคมี; การเจริญเติบโตและการก่อโรคของแบคทีเรีย เชื้อรา และไวรัสในสัตว์ โรคที่เกี่ยวข้องกับการสาธารณสุข เทคนิคการวินิจฉัยทางห้องปฏิบัติการ การทำให้ปลอดเชื้อ เทคนิคการปฏิบัติปลอดเชื้อ และการเก็บตัวอย่าง

Classification, morphology, structure, biochemical properties; the growth, and pathogenicity of bacteria, fungi and virus in animals, diseases related to public health; laboratory diagnostic techniques, sterilization, aseptic techniques and specimen collections

2. Number of hours per semester

Theory (hours)	Practice (hours)	Self-study (hours)
60	0	120

3. Number of Hours per Week for Individual Advice

The first point of directly contact should be your Course Responsible Lecturers. Lecturers are contactable during the university day on the 5th floor Department of Pre-clinic and Applied Animal Science, Faculty of Veterinary Science, Monday-Friday 8.30- 16.30. In an emergency, students can be contacted lecturers directly via email: Kridsada.cha@mahidol.edu or nathita.phu@mahidol.edu

Section 4: Development of the expected learning outcomes

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 : Describe the causes of bacterial, fungal and viral infections, as well as describe the pathogenesis, clinical signs, diagnosis and treatment of diseases that are common problems in domesticated animals in Thailand according to Thailand Veterinary Professional Standards B.E. 2553, item 16 (1-5).
2. CLO2 : Assess the risk of epizootic pathogens and zoonotic pathogens that are caused by bacteria, fungi and viruses, and plan disease prevention to pathogens complied with the Veterinary Professional Standards B.E. 2553, item 16(1-5), 20 and 21(4).
3. CLO3 : Ethical check themselves and be willing to let others check for the benefit of improving the efficiency of animal health care and public health to meet the criteria of the veterinary profession B.E. 2553, item 4.
4. CLO4 : Self-searching the up-to-date information in microbiology that represents lifelong learning

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	Presentation	Demonstration	Role model	MCQ	Individual report	Group report	Presentation assessment	Behavior assessment	Participation
CLO1	✓	✓	✓	✓		✓	✓	✓	✓		✓
CLO2	✓	✓	✓			✓	✓	✓	✓	✓	✓
CLO3	✓				✓					✓	
CLO4	✓	✓	✓		✓			✓		✓	

SECTION 5 LESSON PLAN AND EVALUATION

1. Lesson Plan

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
1	- Introduction to Veterinary Microbiology (General Morphology, Structure and Function of Bacteria) - General Bacterial Classification & Taxonomy - Growth and Reproduction of Bacteria - Bacterial Genetics and Metabolism	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2) Quizzes and self-study (3) Providing PowerPoint handout	Norasuthi, Nathita
2	- Natural Distribution of Bacteria and Bacterial Pathogenesis - Antibiotics and Their Resistance of Bacteria Sterilization and Disinfection	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2) Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Nathita, Kridsada
3	- Gram Positive Bacteria of Veterinary Importance (I) - Gram Positive Bacteria of Veterinary Importance (II)	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2) Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Nathita

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
4	- Acid Fast Bacteria of Veterinary Importance - Gram Negative Bacteria of Veterinary Importance (I)	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Kridsada
5	- Gram Negative Bacteria of Veterinary Importance (II) - Gram Negative Bacteria of Veterinary Importance (III)	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Norasuthi, Dulyatad
6	- Rickettsia, Chlamydia and Mycoplasma - General Properties of Virus - Viral Taxonomy and Viral Replication - Subviral Pathogen and Other Viral-Like Infectious Agent	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Nathita, Wittawat
7	- Viral Pathogenesis - Host Defense Mechanism to Viral Infection - Immune Evasion of Virus - DNA viruses (I)	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Wittawat
8	- DNA viruses (II) - DNA viruses (III)	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Wittawat, Dulyatad
9	- RNA viruses (I) - RNA viruses (II)	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Kridsada
10	- RNA viruses (III) - RNA viruses (IV)	4.00		(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Norasuthi

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
11	- RNA viruses (V) - RNA viruses (VI)	4:00		(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Dulyatad
12	- Reverse transcriptase viruses - Aquatic viruses	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Wittawat, Kridsada
13	- Introduction of Veterinary Mycology - Superficial mycoses and Dermatophytes	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Norasuthi
14	- Subcutaneous and systemic mycoses - Emerging Fungi and Mycotoxicoses	4:00	-	(1) Lecture/short answer questions/ Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Norasuthi
15	Seminar	4:00	-	Group project presentation: ppt	All straff
	Total hours of the entire semester	60	-		

2. Plan for Assessment of Expected Course-Level Learning Outcomes (CLOs)

2.1 Measurement and Evaluation of learning achievement

A. Formative Assessment

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.

B. Summative Assessment

(1) Tool and weight for measurement and evaluation

Learning Outcomes	Evaluation Method*						Weight (Percentage)
	MCQ, MEQ and SEQ	presenta- tion	Group work/re- port	Individual work/re- port	Behavior observa- tion and assess- ment	Participa- tion	
CLO1 : Describe the causes of bacterial, fungal and viral infections, as well as describe the pathogenesis, clinical signs, diagnosis and treatment of diseases that are common problems in domesticated animals in Thailand according to Thailand Veterinary Professional Standards B.E. 2553, item 16 (1-5).	40	5	5	5	-	2	57
CLO2 : Assess the risk of epizootic pathogens and zoonotic pathogens that are caused by bacteria, fungi and viruses, and plan disease prevention to pathogens complied with the Veterinary Professional Standards B.E. 2553, item 16(1-5), 20 and 21(4).	20	5	5	2	-	1	33
CLO3 : Ethical check themselves and be willing to let others check for the benefit of improving the efficiency of animal health care and public health to meet the criteria of the veterinary profession B.E. 2553, item 4.	-	-	-	-	5	-	5
CLO4 : Self-searching the up-to-date information in microbiology that represents lifelong learning	4				1		5
total	74	10	10	7	6	3	100

(2) Measurement and evaluation

The measurement and evaluation use either the criteria-based or group-based system, according to the conditions and methods for academic results evaluation of the Faculty of Veterinary Science, Mahidol University. The grading symbols are: A, B+, B, C+, C, D+, D, and F. Students must receive a 'D' grade or above to pass the criteria.

(3) Re-examination (if the course allows any.)

In case that students received an 'F' grade, the course coordinator and the program's Teaching and Learning Development Committee should, altogether, agreed to allow the students to take the re-examination or extra-course work to pass the course with the following conditions.

For the course with the mean score is higher than 75.00 and the minimum score is not less than 45.00. Students must receive the score higher than 47.50 to take to re-examination or extra-course work.

For the course with the mean score between 60.00 – 74.99, students must receive the score higher than 40.00. However, when the mean score is less than 60.00, students, then, should receive the score higher than 40.00 in order to take the re-examination or extra-course work.

Once students took the re-examination (extra-course work) and the course coordinator had considered the students' re-examination/course work to pass the criteria, then the students will receive the 'D' grade. While waiting for the re-examination or extra-course work result, the students' score should be indicated as 'I' grade.

3. 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 Resources

1. Required Texts

- 1) Songer JG, Post KW. Veterinary Microbiology: Bacterial and Fungal Agents of Animal Disease. Elsevier Health Sciences; 2007.
- 2) Madigan MT, Martinko JM, Dunlap PV, Clark DP. Brock Biology of Microorganisms. 12th ed. Benjamin Cummings; 2008.
- 3) MacLachlan NJ, Dubovi EJ, editors. Fenner's Veterinary Virology, Fourth Edition. 4th ed. Academic Press; 2010.

- 4) Quinn PJ, Markey BK, Carter ME, Donnelly WJ, Leonard FC. Veterinary Microbiology and Microbial Disease. 2nd ed. Wiley-Blackwell; 2011.
- 5) Markey B, Leonard F, Archambault M, Cullinane A, Maguire D. Clinical Veterinary Microbiology 2nd ed. Mosby Ltd; 2013.
- 6) Carroll KC, Pfaller MA, Landry ML, McAdam AJ, Patel R, Richter SS, Warnock DW. Manual of Clinical Microbiology. 11st ed. ASM Press; 2015.

Section 7 Evaluation and Improvement of Course Implementation

1. Strategy for Course Effectiveness Evaluation 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. Strategy for Teaching Evaluation

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. Teaching Improvement

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 Standard of Learning Outcome for the Course

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.

Appendix

Relations between the course and the program

Table 1 Relations between the course and the PLOs

Course Name	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
Veterinary Microbiology (Course Code) VSPA330	R	R	R	R	-	R	R	R

Table 2 Relations between CLOs and PLOs

(Course Code) VSPA330	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1 : Describe the causes of bacterial, fungal and viral infections, as well as describe the pathogenesis, clinical signs, diagnosis and treatment of diseases that are common problems in domesticated animals in Thailand according to Thailand Veterinary Professional Standards B.E. 2553, item 16 (1-5).	✓	✓	✓	✓				
CLO2 : Assess the risk of epizootic pathogens and zoonotic pathogens that are caused by bacteria, fungi and viruses, and plan disease prevention to pathogens complied with the Veterinary Professional Standards B.E. 2553, item 16(1-5), 20 and 21(4).	✓	✓		✓		✓		
CLO3 : Ethical check themselves and be willing to let others check for the benefit of improving the efficiency of animal health care and public health to meet the criteria of the veterinary profession B.E. 2553, item 4.	✓						✓	✓
CLO4 : Self-searching the up-to-date information in microbiology that represents lifelong learning						✓		

CLO1 : Describe the causes of bacterial, fungal and viral infections, as well as describe the pathogenesis, clinical signs, diagnosis and treatment of diseases that are common problems in domesticated animals in Thailand according to Thailand Veterinary Professional Standards B.E. 2553, item 16 (1-5).	✓	✓	✓	✓				
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