



Program: Doctor of Veterinary Medicine
Course title Veterinary Immunology
Course code VSPA331

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

TQF 3 Course Specification

Section 1 General Information

1. Course Code and Title

In Thai	สปปส ๓๓๑	วิทยาภูมิคุ้มกันทางสัตวแพทย์
In English	VSPA 331	Veterinary Immunology

2. Number of Credits

2 (2-0-4)
(Theory 2 hrs. Practice 0 hrs. Self-Study 4 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 Associate Professor Wittawat Wiriyarat

Department of Pre-clinic and Applied Animal Science

Contact: 02-4415242 Ext.1506 e-mail address: wittawat.wir@mahidol.edu

4.1.2 Lecturer Dulyatad Gronsang

Department of Pre-clinic and Applied Animal Science

Contact: 02-4415242 Ext.1505 e-mail address: dulyatad.gro@mahidol.edu

(Name – Surname – Department – Contact: Telephone Number – e-mail address)

4.2 Lecturers

4.2.1 Associate Professor Wittawat Wiriyarat

Department of Pre-clinic and Applied Animal Science

Contact: 02-4415242 Ext.1506 e-mail address: wittawat.wir@mahidol.edu

4.2.2 Assistant Professor Norasuthi Bangphoomi

Department of Pre-clinic and Applied Animal Science

Contact: 02-4415242 Ext.1509 e-mail address: norasuthi.ban@mahidol.edu

4.2.3 Lecturer Kridsada Chaichoun

Department of Pre-clinic and Applied Animal Science

Contact: 02-4415242 Ext.1509 e-mail address: kridsada.cha@mahidol.edu

4.2.4 Lecturer Dulyatad Gronsang

Department of Pre-clinic and Applied Animal Science

Contact: 02-4415242 Ext.1505 e-mail address: dulyatad.gro@mahidol.edu

4.2.5 Lecturer Nathita Phumthanakorn

Department of Pre-clinic and Applied Animal Science

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

4.2.6 Lecturer Karunasinee Suphaphiphat

Faculty of Veterinary Medicine and Applied Zoology, HRH princess Chulabhorn College of Medicinal Science, Chulabhorn Royal Academy

Contact: 02-7655700 Ext.8250 e-mail address: karunasinee.sup@cra.ac.th

4.2.7 Lecturer Savek Kiatsomphob

Faculty of Veterinary Medicine and Applied Zoology, HRH princess Chulabhorn College of Medicinal Science, Chulabhorn Royal Academy

5. Semester/Class Level

5.1 Semester 1 / Class Level Year 3

5.2 Number of Students Allowed Approximately 80 Students

6. Pre-requisite

6.1 VSPA220 Body structure and function 1

6.2 VSPA221 Body structure and function 2

7. Co-requisites

7.1 VSPA330 Veterinary Microbiology

7.2 VSPA333 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

Day 3 Month March Year 2020

Section 2 Aims and Objectives

1. Course Goals

This course is designed for undergraduate students to know, understand the normal functioning of the body's immune system and their immune response to a foreign antigen when it enters through the body, principle of vaccination to stimulate the immune response, which are required by the Professional Standards for Veterinarian Practitioners Guideline. The course motivates students to realize and keep up with the knowledge and technology in Veterinary Immunology, leading to encouraging the short-term, long-term learning of the students, The course also motivates students to have collaboration skill and can apply their knowledge of Veterinary Immunology to develop and create new innovations.

Objectives /Goals of Course Management:

1. Explain from an instructor's intention in a broad perspective of principles, knowledge and skills related to the field of study and consider what skills the course responsible person aims to develop so that the learners can apply those skills for further studies and further careers (in correspondence with requirements at the program level).
2. Course goals will determine the course description accordingly.

2. Objectives of Course Development/Revision

2.1 Course Objectives

This course aims to provide knowledge and abilities as follows:

- 2.1.1.1 To explain the normal functioning of the body's immune system and their immune response against foreign antigens such as bacteria fungi, viruses, allergens and tumor and cancer cells
- 2.1.1.2 To explain the types of vaccination and immune response to the vaccination
- 2.1.1.3 To explain the principles of different antigen and antibody testing methods in the laboratory
- 2.1.1.4 To demonstrate ethics, moral and information searching skill in the field of Veterinary Immunology
- 2.1.1.5 To demonstrate collaboration skill, use the knowledge of Veterinary Immunology to be applied in clinical veterinary, and can pass the examination according to the Professional Standards for Veterinarian Practitioners, B.E. 2553

2.2 Course-level Learning Outcomes: CLOs

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

1. CLO1 describes the functioning of the immune system (innate and adaptive immunity) according to the veterinary professional standards, B.E. 2553, items 15 (1 and 2).

2. CLO2 describes the immune response to bacteria, fungi, viruses and allergens, including explaining the immunopathogenesis according to the veterinary professional standards, B.E. 2553, items 16 (2).
3. CLO3 explains the type of vaccine, vaccination procedure and the immune response to the vaccination according to the Veterinary Professional Standards B.E. 2553, item 20 (3).
4. CLO4 validates self-and peer-assessment to help students improve to implement in animal health and public health according to the Veterinary Professional Standards B.E. 2553, item 20 (4).
5. CLO5 demonstrates self-learning skills to assess updated Veterinary Immunology resources which show continuous self-improvement (lifelong learning)

Section 3 Course Description and Implementation

1. Course Description

ระบบภูมิคุ้มกัน การตอบสนองต่อสารก่อภูมิคุ้มกัน กลไกในการสร้างภูมิคุ้มกัน ภูมิคุ้มกันในการติดเชื้อจุลินทรีย์ชนิดต่างๆ ภาวะภูมิไวเกิน ภูมิคุ้มกันบริเวณพื้นผิว ภูมิคุ้มกันในลูกอ่อน โรคของระบบภูมิคุ้มกัน และวัคซีน

The immune system, the immune response to antigen; mechanisms of immunity, immunity to microbes, hypersensitivity; the immunity at the body surface, the immunity in the fetus and newborn, diseases of the immune system, and vaccine

The course description should reflect the course goals, and it is a concept-based description instead of a teaching topic to facilitate the flexibility of adjusting the lesson plan to keep pace with changes.

2. Number of hours per semester

Theory (hours)	Practice (hours)	Self-study (hours)
30	-	60

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: wittawat.wir@mahidol.edu or dulyatad.gro@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 describes the functioning of the immune system (innate and adaptive immunity) according to the veterinary professional standards, B.E. 2553, items 15 (1 and 2).
2. CLO2 describes the immune response to bacteria, fungi, viruses and allergens, including explaining the immuno-pathogenesis according to the veterinary professional standards, B.E. 2553, items 16 (2).
3. CLO3 explains the type of vaccine, vaccination procedure and the immune response to the vaccination according to the Veterinary Professional Standards B.E. 2553, item 20 (3).
4. CLO4 validates self-and peer-assessment to help students improve to implement in animal health and public health according to the Veterinary Professional Standards B.E. 2553, item 20 (4).
5. CLO5 demonstrates self-learning skills to assess updated Veterinary Immunology resources which show continuous self-improvement (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	Short answer questions	Brainstorming and Buzz group	Group assignment	MCQ, MEQ and SEQ	Group report	presentation	Behavior observation and assessment	Participation
CLO1	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLO2	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLO3	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLO4			✓	✓				✓	✓
CLO5			✓	✓			✓	✓	✓

SECTION 5 LESSON PLAN AND EVALUATION

5. Lesson Plan

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
1	History, Evolution of the Immune system	1.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Wittawat
1	Cells and organs in the Immune system	1.00		1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Wittawat
2	Antigen	1.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Kridsada
2	Antibodies, Ab Production and applications	1.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Kridsada
3	Innate Immunity	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Nathita
4	The MHC and Antigen Presentation	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Norasuthi
5	Humoral Immunity	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study	Norasuthi

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
				(3) Providing PowerPoint handout	
6	Cellular Immunity	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Kridsada
7	Antigens-Antibodies Interaction	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Kridsada
8	Immunopathology	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Dulyatad
9	Immunity to bacteria and fungi	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Nathita
10	Immunity to parasites	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Nathita
11	Immunity to cancer	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Dulyatad
12	Immunity to viruses	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Wittawat

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
13	Passive, maternal immunity and mucosal immunity	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Norasuthi
14	Vaccination and immunization	2.00		(1) Lecture/short answer questions/Brainstorming and Buzz group (2)Assign group work/ Quizzes and self-study (3) Providing PowerPoint handout	Dulyatad
15	Seminar in Veterinary Immunology	2.00		Group assignment/ Presentation	All staffs
	Total hours of the entire semester	30	-		

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	Group work/group report	presentation	Behavior observation and assessment	Participation	
1. CLO1 describes the functioning of the immune system (innate and adaptive	30	0.5	0.5	0.5		32

immunity) according to the veterinary pro-fessional standards, B.E. 2553, items 15 (1 and 2).					0.5	
2. CLO2 describes the immune response to bacteria, fungi, viruses and allergens, including explaining the immune-pathogenesis according to the veterinary professional standards, B.E. 2553, items 16 (2).	30	0.5	0.5	0.5	0.5	32
3. CLO3 explains the type of vaccine, vaccination procedure and the immune response to the vaccination according to the Veterinary Professional Standards B.E. 2553, item 20 (3).	30	0.5	0.5	0.5	0.5	32
4. CLO4 validates self-and peer-assessment to help students improve to implement in animal health and public health according to	-	-	-	1	1	2

the Veterinary Professional Standards B.E. 2553, item 20 (4).						
5. CLO5 demonstrates self-learning skills to assess updated Veterinary Immunology resources which show continuous self-improvement (lifelong learning).	-	1	-	0.5	0.5	2
total	90	2.5	1.5	3	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 processed 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) Abbas AK, Lichtman AH, Pillai S. Cellular and Molecular Immunology. 9th ed. Philadelphia: Elsevier; 2018.
- 2) Tizard IR. Veterinary Immunology. 10th ed. St. Louis, Missouri: Elsevier; 2018.
- 3) Male D, Brostoff J, Roth D and Roitt I. Immunology 8th ed. St. Louis: Mosby; 2012.
- 4) Janeway CA, Travers P, Walport M and Capra JD. Immunobiology: The immune system in health and disease. 8th ed. Garland Publishing; 2012.

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 Immunology								
(Course Code)								
VSPA331	R	R	R	R	-	R	R	R

to help students improve to implement in animal health and public health according to the Veterinary Professional Standards B.E. 2553, item 20 (4).								
5. CLO5 demonstrates self-learning skills to assess up-dated Veterinary Immunology resources which show continuous self-improvement (life-long learning).	1.1					6.1		