Course Specification

Name of Institution Mahidol University

Campus/Faculty/Department Faculty of Veterinary Science

Section 1 General Information

1. Course Code and Title

VSPA 722 Advanced Immunology in Veterinary Science

สพปส 722 วิทยาภูมิคุ้มกันทางการสัตวแพทย์ขั้นสูง

2. Number of Credits

3 (3-0-6) 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

Lect.Dr.Dulyatad Gronsang (DG)

Department of Preclinic and Applied Animal Science

phone number 02-441-5242 ext.1505 e-mail: dulyatad.gro@mahidol.edu

4.2 Lecturers

1. Assoc.Prof. Witthawat Wiriyarat (WW)

Department of Preclinic and Applied Animal Science

phone number 02-441-5242 ext.1507 e-mail: witthawat.wir@mahidol.edu

2. Assist.Prof.Norasuthi Bangphoomi (NB)

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3. Assist.Prof.Nathita Phumthanakorn (NP)

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4. Lect.Dr.Kridsada Chaichoun (KC)
Department of Pre-Clinic and Applied animal science
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5. Lect.Dr.Dulyatad Gronsang (DG)
Department of Preclinic and Applied Animal Science
phone number 02-441-5242 ext.1505 e-mail: dulyatad.gro@mahidol.edu

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

4 January 2024

Section 2 Goals and Objectives

1. Course Goals

This course aims to provide knowledge and abilities as follows:

1) Understand and be able to discuss the mechanisms of stimulation and response to foreign substances entering the body in both innate and adaptive immunity accurately.

2) Understand and be able to discuss the causes and effects of conditions like hypersensitivity, autoimmunity, and immunodeficiency in various forms accurately.

3) Understand and be able to discuss how to apply serological methods and immunological testing techniques correctly for research purposes.

4) Understand and be able to discuss how to create and appropriately use transgenic animals for experimental testing.

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: Understand and be able to discuss the mechanisms of stimulation and response to foreign substances entering the body in both innate and adaptive immunity accurately.

2) CLO2: Understand and be able to discuss the causes and effects of conditions like hypersensitivity, autoimmunity, and immunodeficiency in various forms accurately.

3) CLO3: Understand and be able to discuss how to apply serological methods and immunological testing techniques correctly for research purposes.

4) CLO4: Understand and be able to discuss how to create and appropriately use transgenic animals for experimental testing.

Section 3 Course Management

1. Course Description

VSPA 722 Advanced Immunology in Veterinary Science

สพปส 722 วิทยาภูมิคุ้มกันทางการสัตวแพทย์ขั้นสูง

2. Credit Hours per Semester

Lecture	3	Hour
Laboratory/Field Trip/Internship		Hour
Laboratory	-	Hour
Self Study	6	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: Understand and be able to discuss the mechanisms of stimulation and response to foreign substances entering the body in both innate and adaptive immunity accurately.

2)CLO2: Understand and be able to discuss the causes and effects of conditions like hypersensitivity, autoimmunity, and immunodeficiency in various forms accurately.

3) CLO3: Understand and be able to discuss how to apply serological methods and immunological testing techniques correctly for research purposes.

4) CLO4: Understand and be able to discuss how to create and appropriately use transgenic animals for experimental testing.

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	Assignment	Presentation	Answering and discussion	Class attention
CLO1	X	X	X	X	X
CLO2	X	X	X	X	X
CLO3	X	X	X	X	X
CLO4	X	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	Current topic in cytokines	3	-	6	- Assignment - Presentation - Discussion	1,2	NP and staffs
2	Pattern recognition by cells of the innate immune system	3	-	6	- Assignment - Presentation - Discussion	1,2	NB and Staffs
3	The complement system and innate immunity	3	-	6	- Assignment - Presentation - Discussion	1,2	DG and staffs
4	Current topic in NK cells	3	-	6	- Assignment - Presentation - Discussion	1,2	DG and Staffs
5	Current topic in dendritic cells	3	-	6	- Assignment - Presentation - Discussion	1,2	NB and Staffs
6	Current topic in T-cells responses (I) – Advanced concept	3	-	6	- Assignment - Presentation - Discussion	1,2,3	WW and Staffs
7	Current topic in T-cells responses (II) – Laboratory application	3	-	6	- Assignment - Presentation - Discussion	1,2,3	WW and Staffs
8	Current topic in B-cells responses (I) – Advanced concept	3	-	6	- Assignment - Presentation - Discussion	1,2,3	NB and Staffs

Week or No.	Topic	Hours			Teaching Methods / Media	CLOs	Lecturers
		Lecture	Laboratory	Self Study			
9	Current topic in B-cells responses (II) – Laboratory application	3	-	6	- Assignment - Presentation - Discussion	1,2,3	NB and Staffs
10	Current topic in Hypersensitivity	3	-	6	- Assignment - Presentation - Discussion	1,3	DG and Staffs
11	Current topic in immune tolerance and autoimmunity	3	-	6	- Assignment - Presentation - Discussion	1,3	DG and Staffs
12	Current topic in vaccination	3	-	6	- Assignment - Presentation - Discussion	1,2	KC and Staffs
13	Current topic in tumor immunology	3	-	6	- Assignment - Presentation - Discussion	1,2	DG and Staffs
14	Animal model in immunopathological study (transgenic animal)	3	-	6	- Assignment - Presentation - Discussion	2,4	KC and Staffs
15	Conference: selected topics in immunology	3	-	6	- Seminar - Presentation - Discussion	1,2,3,4	Staffs
รวมจำนวนชั่วโมงตลอดภาคการศึกษา		**45**	**-**	**90**			

2. Evaluation Plan

Learning Outcomes	Evaluation Method			Weight (Percentage)
	presentation	Answering and discussion	Class attention	
CLO1: Understand and be able to discuss the mechanisms of stimulation and response to foreign substances entering the body in both innate and adaptive immunity accurately.	14	21	1	**36**
CLO2: Understand and be able to discuss the causes and effects of conditions like hypersensitivity, autoimmunity, and immunodeficiency in various forms accurately.	13	22	1	**36**
CLO3: Understand and be able to discuss how to apply serological methods and immunological testing techniques correctly for research purposes.	7	12	1	**20**
CLO4: Understand and be able to discuss how to create and appropriately use transgenic animals for experimental testing.	2	5	1	**8**
Total	**36**	**60**	**4**	**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 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 proposed to the faculty's appealing committee to address the issue.

Section 6 Teaching Materials and Resources

1. Textbooks and Main Documents

1. Abbas AK, Lichtman AH, Pillai S. Cellular and Molecular Immunology. 9th ed. Philadelphia: Else-vier; 2018.
2. Basic Immunology: Functions and Disorders of the Immune System A.K. Abbas, A.H.H. Lichtman, S. Pillai. 5th Ed. Elsevier, 2016, 335 pp.
3. Cytokines and Autoimmune Diseases. V.K. Kuchroo, N. Sarvetnick, D.A. Hafler, , L.B. Nicholson. (Eds.) Humana Press Inc. 2002, 422 pp.
4 Dendritic Cells, Second Edition: Biology and Clinical Applications. M.T. Lotze and A.W. Thomson. 2nd Ed. Academic Press. 2001. 822 pp.
5 Male D, Brostoff J, Roth D and Roitt I. Immunology 8th ed. St. Louis: Mosby; 2012.

6 Tizard IR. Veterinary Immunology. 10th ed. St. Louis, Missouri: Elsevier; 2018.

7 Transgenic Animal Technology: A Laboratory Handbook. Carl A. Pinkert. 3rd Ed. 2014. 696 pp.

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 722/ Advanced Immunology in Veterinary Science / 3 (3-0-6)		M	M	M	P	M

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: Understand and be able to discuss the mechanisms of stimulation and response to foreign substances entering the body in both innate and adaptive immunity accurately.		M	M	M	P	M
CLO2: Understand and be able to discuss the causes and effects of conditions like hypersensitivity, autoimmunity, and immunodeficiency in various forms accurately.		M	M	M	P	M
CLO3: Understand and be able to discuss how to apply serological methods and immunological testing techniques correctly for research purposes.		M	M	M	P	M
CLO4: Understand and be able to discuss how to create and appropriately use transgenic animals for experimental testing		M	M	M	P	M

Course schedule VSPA 722 (Advanced Immunology in Veterinary Science)

For master's degree Students, Second Semester, Academic Year 2023

Conducted at Seminar room No.2 of the Faculty of Veterinary Science Library, 3rd Floor, Mahidol University

Topics	Date	Time	Teaching Methods /Media	Topic	Lecturers
1	9/1/2024	9.00-12.00 am.	Lecture	Current topic in cytokines	NP and staff
2	16/1/2024	9.00-12.00 am.	Lecture	Pattern recognition by cells of the innate immune system	NB and staff
3	23/1/2024	9.00-12.00 am.	Lecture	The complement system and innate immunity	DG and staff
4	30/1/2024	9.00-12.00 am.	Lecture	Current topic in NK cells	DG and staff
5	6/2/2024	9.00-12.00 am.	Lecture	Current topic in dendritic cells	NB and staff
6	13/2/2024	9.00-12.00 am.	Lecture	Current topic in T-cells responses (I) – Advanced concept	WW and staff
7	20/2/2024	9.00-12.00 am.	Lecture	Current topic in T-cells responses (II) – Laboratory application	WW and staff
8	27/2/2024	9.00-12.00 am.	Lecture	Current topic in B-cells responses (I) – Advanced concept	NB and staff
9	5/3/2024	9.00-12.00 am.	Lecture	Current topic in B-cells responses (II) – Laboratory application	NB and staff
10	12/3/2024	9.00-12.00 am.	Lecture	Current topic in Hypersensitivity	DG and staff
11	19/3/2024	9.00-12.00 am.	Lecture	Current topic in immune tolerance and autoimmunity	DG and staff
12	26/3/2024	9.00-12.00 am.	Lecture	Current topic in vaccination	KC and staff
13	2/4/2024	9.00-12.00 am.	Lecture	Current topic in tumor immunology	DG and staff
14	9/4/2024	9.00-12.00 am.	Lecture	Animal model in immunopathological study (transgenic animal)	KC and staff
15	30/4/2024	9.00-12.00 am.	Lecture	Conference: selected topics in immunology	DG/WW/NB/NP/KC