

Course Specification

Section 1 General Information

1. Course Code and Title

In Thai	สพปส ๘๗๔	พยาธิวิทยาของโรคสัตว์สู่คน
In English	VSPA 874	Pathology of zoonotic diseases

2. Number of Credits

1 (1-0-2)

(Theory 1 hrs. Practice 0 hrs. Self-Study 2 hrs./week)

3. Curriculum and Course Type

3.1 Program	Doctor of Philosophy in Veterinary Science (International Program)		
3.2 Course Type	Specific Course	☐ Compulsory Course	☒ Elective Course

4. Course Coordinator and Instructor

4.1 Course Responsible Instructor

Department of Pre-clinic and Applied Animal Science

- Dr. Kripitch Sutummaporn (KS)

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4.2 Instructors

Department of Pre-clinic and Applied Animal Science

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Department of clinical sciences and public health

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5. Semester/Class Level

- 5.1 Semester 1 / Class Level or year 1
- 5.2 Number of Students Allowed Approximately 20 Students

6. Prerequisites

None

7. Co-requisites

None

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

31st July 2026

Section 2 Course Goals and Course Description

1. Course Goals

1. To develop advanced expertise in synthesizing pathological mechanisms, host-pathogen interactions, and epidemiological patterns to accurately diagnose emerging and re-emerging zoonotic diseases and map their clinical correlations between animal hosts and humans.
2. To equip students with the skills to apply cutting-edge molecular pathology and molecular epidemiology tools to design diagnostic surveillance frameworks and lead effective investigations during zoonotic disease outbreak scenarios.
3. To cultivate high ethical standards, animal welfare compliance, collaborative leadership, and technical communication skills necessary for managing multidisciplinary outbreak investigations and conveying complex epidemiological data.

2. Course Description

(In Thai) พยาธิวิทยา การตรวจวินิจฉัยเพื่อการเฝ้าระวัง การสืบสวน โรคสัตว์สู่คน และความสัมพันธ์ทางคลินิกที่เกี่ยวข้องกับมนุษย์และการระบาดของโรค

(In English) Pathology, diagnostic surveillance, investigation of zoonotic diseases in animals and clinical correlation in humans and outbreak scenarios

Section 3 Course Objectives, Course-level Learning Outcomes and Course Implementation

1. Course Objectives

1. Students are able to synthesize knowledge of pathology and epidemiology to accurately diagnose emerging zoonotic diseases.
2. Students are able to analyze and integrate knowledge regarding the epidemiology and pathogenesis of major zoonotic diseases correctly.
3. Students are able to connect molecular pathology and molecular epidemiology to conduct outbreak investigations and surveillance of zoonotic diseases accurately.

2. Course-level Learning Outcomes: CLOs

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

- 1) CLO1 Synthesize pathological findings and epidemiological patterns to accurately diagnose emerging and re-emerging zoonotic diseases in animals.
- 2) CLO2 Critically analyze and integrate knowledge of disease pathogenesis, diagnostic surveillance, and host-pathogen interactions to correlate animal zoonoses with human clinical manifestations.
- 3) CLO3 Apply advanced molecular pathology and molecular epidemiology techniques to investigate disease outbreaks and implement effective surveillance systems for zoonotic threats.
- 4) CLO4 Formulate and carry out diagnostic surveillance and outbreak investigation protocols in accordance with professional ethical standards and biosafety regulations.
- 5) CLO5 Demonstrate leadership and effective teamwork in analyzing complex outbreak scenarios, effectively communicating findings using appropriate information technology and statistical methods to multi-disciplinary audiences.

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

CLOs	Teaching and learning experience management	Learning outcome measurement
CLO1	• Problem-Based Learning (PBL) • Case-Based Learning (PBL) • Interactive lecture and discussions	• Case-based written examinations/assignments. • Individual seminar presentation.
CLO2	• Interactive lectures • Critical reading and discussion of recent scientific literature	• Short-answer and essay questions in written assessments. • Individual presentation.
CLO3	• Interactive lectures and discussion	• Written examinations/assignments. • Individual presentation.
CLO4	• Interactive lectures and discussion	• Written examinations/assignments. • Individual presentation.
CLO5	• Academic presentation • Faculty and peer Q&A sessions following student seminars.	• Individual presentation. • Oral Question and answer during the seminar.

Section 4 Lesson Plan and Evaluation

1. Lesson Plan

Week	Topic	Hours		Teaching Methods/ Media	Instructors
		Lecture	Lab		
1	Introduction to Zoonotic Pathology & One Health Surveillance	1	-	Interactive lecture/PPT	AW/SSU
2	Pathogenesis & Mechanisms of Interspecies Transmission	1	-	Problem-Based Learning (PBL)/PPT	KS
3	Individual Student Seminars I: Complex Outbreak Scenarios	1	-	Seminar, Faculty and peer Q&A sessions following student seminars/PPT	All staffs
4	Advanced Molecular Pathology Diagnostics for zoonotic disease	1	-	Seminar and Discussion/PPT	KC/DG
5-6	Pathology of Emerging Viral Zoonoses	2	-	Seminar and Discussion/PPT	KC/DG
7	Pathology of emerging res-	1		Seminar/Discussion	WW

	piratory virus and viral hemorrhagic disease			/PPT	
8	Pathology of High- Consequence Bacterial Zo- onose: Host- agent interac- tion of intra- cellular and extracellular bacteria	1	-	Seminar and Discus- sion/PPT	NP
9-10	Pathology of superficial, subcutaneous, and systemic mycoses: Host-agent interaction of mycoses	2	-	Interactive lecture/PPT	NS/DG
11	Individual Student Semi- nars II: Patho- logical investi- gation of emerging dis- eases	1	-	Seminar, Faculty and peer Q&A ses- sions following student semi- nars/PPT	All staffs
12-13	Pathogenesis of Vector- Borne & Ne-	2		Seminar and discussion	SS/CJ/TC

	glected Zoonoses: Host agent interaction of parasitic disease				
14	Neuropathology of Prion & Neurotropic Diseases	1	-	Problem-based learning/PPT	KS
15	Individual Student Seminars: Update diagnostic pathology for investigating zoonotic diseases	1	-	Seminar, Faculty and peer Q&A sessions following student seminars/PPT	All staffs
Total		15	0		

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)
	Examination	Seminar	
CLO1 Synthesize pathological findings and epidemiological patterns to accurately diagnose emerging and re-emerging zoonotic diseases in animals.	10%	15%	25%
CLO2 Critically analyze and integrate knowledge of disease pathogenesis, diagnostic surveillance, and host-pathogen interactions to correlate animal zoonoses with human clinical manifestations.	10%	15%	25%
CLO3 Apply advanced molecular pathology and molecular epidemiology techniques to investigate disease outbreaks and implement effective surveillance systems for zoonotic threats.	10%	10%	20%
CLO4 Formulate and carry out diagnostic surveillance and outbreak investigation protocols in ac-	5%	10%	15%

Learning Outcomes	Evaluation Method		Weight (Percentage)
	Examination	Seminar	
cordance with professional ethical standards and biosafety regulations.			
CLO5 Demonstrate leadership and effective teamwork in analyzing complex outbreak scenarios, effectively communicating findings using appropriate information technology and statistical methods to multidisciplinary audiences.	15%	0%	15%
Total	50%	50%	100%

(2) Grading Rules

A, B+, B, C+, C, D+, D, and F

(3) Measurement and Evaluation

The evaluation uses either a criterion-referenced or norm-referenced system in accordance with the Faculty of Veterinary Science, Mahidol University's grading policies. Grades are assigned as A, B+, B, C+, C, D+, D, and F. Students must receive a B or higher to pass.

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

If a student receives an F, and the course coordinator and the teaching committee deem it appropriate to allow a retake examination or additional work, the student must have a score of at least 47.50 for score sets with an average above 75.00, and at least 45.00 for score sets with an average between 60.00 and 74.99. For score sets with an average below 60.00, the student must have a score of at least 40.00 to be eligible for a retake examination or additional work. If the course

coordinator considers the retake examination or additional work as "pass," the student's grade will be changed to D. During the period of retake examination or additional work, the student's grade will be temporarily marked as I (Incomplete).

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 5 Teaching Resources

1. Required Texts

1. Maxie, M. G. (Ed.). (2016). Jubb, Kennedy & Palmer's pathology of domestic animals (6th ed., Vols. 1–3). Elsevier
2. Palmer, S. R., Soulsby, L., Torgerson, P. R., & Brown, D. W. G. (Eds.). (2011). Oxford textbook of zoonoses: Biology, clinical practice, and public health control (2nd ed.). Oxford University Press.
3. Terio, K. A., McAloose, D., & St. Leger, J. (Eds.). (2018). Pathology of wildlife and zoo animals. Academic Press.

2. Suggested Materials

- 1) Atlas, R. M., & Maloy, S. (Eds.). (2014). *One health: People, animals, and the environment*. ASM Press.
Academic Search Ultimate (EBSCLO)
- 2) Riley, L. W. (2004). *Molecular epidemiology of infectious diseases: Principles and applications*. ASM Press.
- 3) Thrusfield, M., & Christley, R. (2018). *Veterinary epidemiology* (4th ed.). Wiley-Blackwell.
- 4) SCOPUS
- 5) Centers for Disease Control and Prevention. (2021). *CDC field epidemiology manual*. Oxford University Press.

6) World Organisation for Animal Health. (2023). *Manual of diagnostic tests and vaccines for terrestrial animals* (12th ed.). WOA. <https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-manual-online-access/>

3. Other Resources (if any)

1. Quadripartite One Health Joint Plan of Action (2022–2026)
2. Taking a Multisectoral, One Health Approach: A Tripartite Guide to Addressing Zoonotic Diseases in Countries (TZG)
3. Joint Risk Assessment Operational Tool (JRA OT)
4. WOA World Animal Health Information System (WAHIS)
5. NCBI GenBank & BLAST:

Section 6 Evaluation and Improvement of Course Implementation

1. Analysis and Evaluation of Course Implementation

A. Data for Analysis

Course evaluation forms (e-evaluation system) and Results of course evaluations (e-evaluation system) based on the following information:

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

B. Course Effectiveness Evaluation

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.

2. Revision Process and Improvement Plan for Course Effectiveness

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.

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 above.

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.

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.

3. The self-assessment report of the course

MM5 form is submitted at the end of the course instruction and evaluation period.

Appendix

1. Relations between the course and the program

Table 1 Relations between the course and the PLOs

	PLOs				
	PLO1	PLO2	PLO3	PLO4	PLO5
VSPA874 Pathology of zoonotic diseases 1 (1-0-2)	R	R	R	R	R

Table 2 Relation between CLOs and PLOs

CLOs	PLOs				
	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1 Synthesize pathological findings and epidemiological patterns to accurately diagnose emerging and re-emerging zoonotic diseases in animals.		X			
CLO2 Critically analyze and integrate knowledge of disease pathogenesis, diagnostic surveillance, and host-pathogen interactions to corre-		X			X

late animal zoonoses with human clinical manifestations.					
CLO3 Apply advanced molecular pathology and molecular epidemiology techniques to investigate disease outbreaks and implement effective surveillance systems for zoonotic threats.		X	X		X
CLO4 Formulate and carry out diagnostic surveillance and outbreak investigation protocols in accordance with professional ethical standards and biosafety regulations.	X		X		
CLO5 Demonstrate leadership and effective teamwork in analyzing complex outbreak scenarios, effectively communicating findings using appropriate information technology and statistical methods to multidisciplinary audiences.				X	X

Table 3 PLOs and SubPLOs that the course is responsible for

PLOs	SubPLOs
PLO1 Work and behave with morals and ethics of professional standard.	-
PLO2 Have knowledge in companion animal medicine, production medicine, pathology and epidemiology.	-
PLO3 Analyze, criticize and develop research proposals using appropriate methodology with ethical standards for animal uses.	-
PLO4 Have responsibility to group and individual works, good interpersonal relation, and an appropriate role as either leaders or followers.	-
PLO5. Apply analytical thinking in mathematics, communication skills, and information technology skills for data collection, statistical analysis and public presentation	-

2. Rubric scoring*

Evaluation Domain	Excellent (90–100%)	Proficient (75–89%)	Developing (60–74%)	Unsatisfactory (< 60%)
1. Pathological Synthesis & Clinical Correlation (25 Points)	Flawlessly synthesizes gross/histopathological findings with epidemiological data. Accurately links animal pathology to human clinical manifestations and	Correctly identifies primary pathology and links animal disease to human clinical correlation	Identifies general pathology but struggles to integrate epidemiological context or draw clear animal-to-human	Inaccurate diagnostic reasoning, major errors in pathological analysis, or fails to connect human and animal disease aspects.

Evaluation Domain	Excellent (90–100%)	Proficient (75–89%)	Developing (60–74%)	Unsatisfactory (< 60%)
Aligned with CLO 1, CLO 2	pathogenesis.	with minor gaps in pathogenesis depth.	clinical links.	
2. Molecular Tools & Outbreak Investigation Strategy (25 Points) Aligned with CLO 3	Proposes appropriate, cutting-edge molecular pathology tools (e.g., NGS, ISH) and accurately interprets genomic/phylogenetic tracing data for outbreak resolution.	Selects relevant molecular tools and outlines a sound diagnostic workflow, though explanation of phylogenetics or spatial tools lacks minor depth.	Suggests standard diagnostic methods but fails to demonstrate advanced molecular epidemiology or modern tracing strategies.	Proposes inappropriate or outdated molecular methods; lacks understanding of outbreak tracing or molecular diagnostics.
3. Biosafety, Ethics & Field Protocols (15 Points) Aligned with	Integrates relevant biosafety levels (BSL-3/4), field biosecurity protocols, animal ethics (IACUC), and regulatory compliance seamlessly into the scenario.	Mentions necessary biosafety levels and ethics guidelines correctly, with minor omissions in specific field	Superficial inclusion of biosafety or ethics; treats compliance as an afterthought rather than a core protocol.	Ignores biosafety, biosecurity, or ethical considerations entirely; proposes unsafe handling or non-compliant

Evaluation Domain	Excellent (90–100%)	Proficient (75–89%)	Developing (60–74%)	Unsatisfactory (< 60%)
CLO 4		protocol details.		field procedures.
4. Visual Presentation & Technical Communication (20 Points) Aligned with CLO 5	Slides are exceptionally clear, professional, and well-structured. Complex data (histopathology, phylogenetic trees) are presented with high clarity and scannability.	Presentation is clear, well-paced, and structured logically. Visuals effectively support the content with minimal slide clutter.	Presentation is overly dense, hard to follow, or relies heavily on reading text directly off slides. Visuals are unclear or unformatted.	Unprofessional slide design, severe time mismanagement, illegible figures, or incoherent narrative flow.
5. Q&A Defense & Scientific Reasoning (15 Points) Aligned with CLO 5	Defends diagnostic choices with high authority, demonstrating deep scientific mastery, critical thinking, and quick adaptation during peer/faculty Q&A.	Answers questions accurately and logically, showing solid command of the material with minor hesitation on complex edge cases.	Struggles with challenging questions, provides vague or generic answers, or shows difficulty defending specific methodological choices.	Unable to answer basic questions regarding the presentation; shows significant gaps in underlying subject knowledge.

3. Relations between the course and Sustainable Development Goals (SDGs)

- ☐ SDG1 No poverty
- ☒ SDG2 Zero Hunger
- ☒ SDG3 Good Health and Well – being
- ☒ SDG4 Quality Education
- ☐ SDG5 Gender Equality
- ☐ SDG6 Clean Water and Sanitation
- ☐ SDG7 Affordable and Clean Energy
- ☐ SDG8 Decent Work and Economic Growth
- ☐ SDG9 Industry, Innovation and Infrastructure
- ☐ SDG10 Reduced Inequalities
- ☐ SDG11 Sustainable Cities and Communities
- ☐ SDG12 Responsible Consumption and Production
- ☐ SDG13 Climate Action
- ☐ SDG14 Life Below Water
- ☒ SDG15 Life on Land
- ☐ SDG16 Peace, Justice and Strong Institutions
- ☒ SDG17 Partnerships for the goals

Course schedules
Pathology of zoonotic diseases

Weeks	Date and time	Topics	Instructors	Venue
1	28/9/2026 9.00-10.00	Introduction to Zoonotic Pathology & One Health Surveillance	AW/SSU	Small seminar room 5 th floor
2	12/10/2026 9.00-10.00	Pathogenesis & Mechanisms of Interspecies Transmission	KS	Sakul Kraisorn
3	19/10/2026 9.00-10.00	Individual Student Seminars I: Complex Outbreak Scenarios	All staffs	Online
4	26/10/2026 9.00-10.00	Advanced Molecular Pathology Diagnostics for zoonotic disease	KC/DG	Small seminar room 5 th floor
5-6	2/11/2026 9.00-11.00	Pathology of Emerging Viral Zoonoses	KC/DG	Sakul Kraisorn
7	9/11/2026 9.00-10.00	Pathology of emerging respiratory virus and viral hemorrhagic disease	WW	Sakul Kraisorn
8	9/11/2026 10.00-11.00	Pathology of High-Consequence Bacterial Zoonoses: Host-agent interaction of intracellular and extracellular bacteria	NP	Sakul Kraisorn
9-10	16/11/2026 9.00-11.00	Pathology of superficial, subcutaneous, and systemic mycoses: Host-agent interaction of mycoses	NB/DG	Sakul Kraisorn
11	23/11/2026 9.00-10.00	Individual Student Seminars II: Pathological investigation of	All staffs	Online

		emerging diseases		
12-13	30/11/2026 9.00-11.00	Pathogenesis of Vector-Borne & Neglected Zoonoses: Host agent interaction of parasitic disease	SS/CJ/TC	Small seminar room 5 th floor
14	14/12/2026 9.00-10.00	Neuropathology of Prion & Neuro-tropic Diseases	KS	Sakul Kraisorn
15	21/12/2026 9.00-10.00	Individual Student Seminars: Up-date diagnostic pathology for investigating zoonotic diseases	All staffs	Online

Onsite meeting room

The Sakul Kraisorn meeting room is located at the 5th floor, and the small seminar room is opposite the Sakul Kraisorn meeting room.

Online link for all seminar

1. Seminar 1 VSPA874 Pathology of Zoonotic Diseases

Monday, October 19 · 9:00 – 10:00am

Time zone: Asia/Bangkok

Google Meet joining info

Video call link: <https://meet.google.com/gaq-tpqx-ney>

Or dial: (TH) +66 2 844 9331 PIN: 409 463 951 6445#

More phone numbers: <https://tel.meet/gaq-tpqx-ney?pin=4094639516445>

2. Seminar 2 VSPA874 Pathology of Zoonotic Diseases

Monday, November 23 · 9:00 – 10:00am

Time zone: Asia/Bangkok

Google Meet joining info

Video call link: <https://meet.google.com/zdo-xybg-rfj>

Or dial: (TH) +66 2 844 9331 PIN: 546 260 179 0867#

More phone numbers: <https://tel.meet/zdo-xybg-rfj?pin=5462601790867>

3. Seminar 3 VSPA874 Pathology of Zoonotic Disease

Monday, December 21, 2026 · 9:00 – 10:00am

Time zone: Asia/Bangkok

Google Meet joining info

Video call link: <https://meet.google.com/idk-bzkg-dus>

Or dial: (TH) +66 2 844 9331 PIN: 421 565 663 9656#

More phone numbers: <https://tel.meet/idk-bzkg-dus?pin=4215656639656>