



Program: Doctor of Veterinary Medicine
Course title Principles of Veterinary Pharmacology.
Course code VSPA 327

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

TQF 3 Course Specification

Section 1 General Information

1. Course Code and Title

In Thai	สพปส ๓๒๗ หลักเภสัชวิทยาทางสัตวแพทย์
In English	VSPA327 Principles of Veterinary Pharmacology

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

1. Assist. Prof. Dr. Boonrat Chantong	Department of Pre-clinic and Applied Animal Science
Telephone Number 081-684-8882	e-mail address: boonrat.cha@mahidol.edu
2. Assist. Prof. Dr. Paranee Yatmark	Department of Pre-clinic and Applied Animal Science
Telephone Number 081-856-7181	e-mail address: paranee.yat@mahidol.edu

4.2 Lecturers

1. Assist. Prof. Dr. Boonrat Chantong	Department of Pre-clinic and Applied Animal Science
Telephone Number 081-684-8882	e-mail address: boonrat.cha@mahidol.edu
2. Assist. Prof. Dr. Paranee Yatmark	Department of Pre-clinic and Applied Animal Science
Telephone Number 081-856-7181	e-mail address: paranee.yat@mahidol.edu
3. Assoc. Prof. Dr. Sookruetai Boonmasawai	Department of Pre-clinic and Applied Animal Science
Telephone Number 02-441-5242 ext 1533	e-mail address: sookruetai.boon@mahidol.ac.th
4. Assist. Prof. Dr. Arpron Leesombun	Department of Pre-clinic and Applied Animal Science
Telephone Number 02-441-5242 ext 1535	e-mail address: arpron.lee@mahidol.ac.th
5. Assist. Prof. Phingphol Charoonrut	Department of Department of Clinical Science and Public Health
Telephone Number 02-441-5242 ext 2235	e-mail address: phingphol.cha@mahidol.ac.th



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5. Semester/Class Level

5.1 Semester 2 / Class Level 3

5.2 Number of Students Allowed Approximately 80 Students

6. Pre-requisite

VSPA 223. Body structure and function IV

VSPA 226 Integrated veterinary biochemistry

7. Co-requisites

-

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

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

Section 2 Aims and Objectives

1. Course Goals

Objectives /Goals of Course Management:

1. Describe the main concepts of pharmacology as well as the criteria for medication selection, route of drug administration, and drug preparation for effective animal treatment.
2. Describe the fundamental pharmaceutical concept and calculate the basic pharmaceutical parameters.
3. Describe the principles of pharmacokinetics and pharmacodynamics, including the mechanism of action, absorption, drug distribution, metabolism, and excretion in each category.
4. Describe the principles of pharmacokinetics, the calculation of pharmacokinetics, and the mechanism of pharmacological effects in animals.
5. Describe the principle of drug categorization, the characteristics per each class of drugs, the action of drugs in the treatment of disease, therapeutic application, adverse effects, and toxicities of generally administered drugs in veterinary medicine.

2. Objectives of Course Development/Revision

2.1 Course Objectives

This course aims to provide knowledge and abilities as follows:

1. Possessing knowledge and understanding of the concepts of fundamental pharmacology
2. Applying knowledge to use in veterinary diagnostics, disease prevention, and treatment



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3. Integrating expertise in veterinary diagnostics, disease prevention, and treatment through from a technical and veterinary council standard perspective.
4. Developing moral, ethics, discipline, integrity, responsibility, and consciousness in regard to veterinary professional ethics.

2.2 Course-level Learning Outcomes: CLOs

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

1. CLO1 Calculate the basic pharmaceutical parameters and describe the fundamental pharmaceutical concept, drug preparation, and drug administration. Describe the principles of pharmacokinetics, pharmacokinetic calculation, and the mechanism of pharmacological effects in animals, as well as the mechanism and consequence of drug side effects on animals.
2. CLO2 Describe the pharmacokinetics, pharmacodynamics, mechanism of action, clinical application, adverse drug effect, and contraindications of antipyretics, opioids, analgesics, steroid, non-steroidal anti-inflammatory drugs, autocoids, antiseptics, and disinfectants, and can evaluate the advantage of the use of vitamins, feed additives, and antioxidants in veterinary use and can implement the knowledge in veterinary application.
3. CLO3 Explain the procedure of new drug registration and the legislation governing pharmaceutical products in veterinary medicine.

Section 3 Course Description and Implementation

1. Course Description

หลักการพื้นฐานของเภสัชวิทยาสัตวแพทย์ ความสำคัญและคำอธิบายของวิชาเภสัชวิทยา คุณสมบัติของยาและรูปแบบเภสัชภัณฑ์ เอกสารกำกับยา เภสัชตำรับ วิธีการนำยาเข้าสู่ร่างกายสัตว์ หลักการและข้อพิจารณาการใช้ยา ข้อกำหนดและการควบคุมผลิตภัณฑ์ยา หลักการของเภสัชจลนศาสตร์และเภสัชพลศาสตร์ ปฏิกิริยาระหว่างยา ความแปรปรวนของการตอบสนอง หลักเกณฑ์วิธีการที่ดีในการผลิตยา วิตามิน อาหารเสริม สารต้านอนุมูลอิสระ สารน้ำและอิเล็กโทรไลต์ เภสัชพันธุศาสตร์ พันธุกรรมบำบัด และหัวข้อปัจจุบันทางเภสัชวิทยา

Principles of veterinary pharmacology; the importance and description of pharmacology, pharmaceutical dosage forms and regimens, leaflet, pharmaceutical formulations, routes of drug administration; concept and rationale use of drugs, drug regulations and authorities, principles of pharmacokinetics and pharmacodynamics; drug interaction, variation in drug responses, Good Manufacturing Practice (GMP), vitamins, feed additives, antioxidants, fluid and electrolytes, pharmacogenomic, gene therapy, and current topics in pharmacology



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2. Number of hours per semester

Theory (hours)	Practice (hours)	Self-study (hours)
15	0	30

3. Number of Hours per Week for Individual Advice

1 hour/week (only on Wednesday)

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 Calculate the basic pharmaceutical parameters and describe the fundamental pharmaceutical concept, drug preparation, and drug administration. Describe the principles of pharmacokinetics, pharmacokinetic calculation, and the mechanism of pharmacological effects in animals, as well as the mechanism and consequence of drug side effects on animals.
2. CLO2 Describe the pharmacokinetics, pharmacodynamics, mechanism of action, clinical application, adverse drug effect, and contraindications of antipyretics, opioids, analgesics, steroids, non-steroidal anti-inflammatory drugs, autocoids, antiseptics, and disinfectants, and can evaluate the advantage of the use of vitamins, feed additives, and antioxidants in veterinary use and can implement the knowledge in veterinary application.
3. CLO3 Explain the procedure of new drug registration and the legislation governing pharmaceutical products in veterinary medicine.



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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	MCQ
CLO1	X	X
CLO2	X	X
CLO3	X	X

SECTION 5 LESSON PLAN AND EVALUATION

1. Lesson Plan

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
1.	Introduction and basic principle in pharmacology	2	-	Lecture: ppt, online lessons, group discussion	Assoc. Prof. Dr. Sookruetai Boonmasawai
2.	Drug administration and drug preparations in veterinary medicine	1	-	Lecture: ppt, online lessons, group discussion	Assoc. Prof. Dr. Sookruetai Boonmasawai
	Medical terminology in veterinary medicine and calculation of pharmaceutical parameters	1	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Arpron Leesombun
3.	Good Manufacturing Practice (GMP)	1	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Arpron Leesombun
4.	Concepts in Pharmacokinetics 1	3	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Boonrat Chantong
	Concepts in Pharmacokinetics 2	1	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Paranee Yatmark.
5.	Concepts in Pharmacodynamics	1	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Boonrat Chantong



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Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
	Concepts in Pharmacodynamics	2	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Paranee Yatmark.
6.	Calculation in Pharmacokinetics and Pharmacodynamics	2	-	Group discussion	Assist. Prof. Dr. Paranee Yatmark. and team
7.	Drug interaction and variation in drug responses	2	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Arpron Leesombun
8.	Antipyretic drugs	1	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Arpron Leesombun
9.	Opioids and analgesics	2	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Arpron Leesombun
10	Autocoids and anti-autocoids	2	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Paranee Yatmark. and team
11	Steroids and non-steroidal anti-inflammatory drugs,	3	-	Lecture: ppt, online lessons, group discussion	Assoc. Prof. Dr. Sookruetai Boonmasawai
12	Vitamins, feed additives, and antioxidants	2	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Paranee Yatmark. and team
13.	Antiseptics, disinfectants, and sterilants	2	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Boonrat Chantong Assist. Prof. Phingphol Charoonrut
14	Drug regulations and registration of pharmaceutical products in veterinary medicine	2	-	Lecture: ppt, online lessons, group discussion	Assist. Prof. Dr. Boonrat Chantong
	Total hours of the entire semester	30	-		



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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	Group work	Individual work presentation	..xx..	
1. CLO1 Calculate the basic pharmaceutical parameters and describe the fundamental pharmaceutical concept, drug preparation, and drug administration. Describe the principles of pharmacokinetics, pharmacokinetic calculation, and the mechanism of pharmacological effects in animals, as well as the mechanism and consequence of drug side effects on animals.	40	-	5	-	45
2. CLO2 Describe the pharmacokinetics, pharmacodynamics, mechanism of action, clinical application, adverse drug effect, and contraindications of antipyretics, opioids, analgesics, steroids, non-steroidal anti-inflammatory drugs, autocoids, antiseptics, and disinfectants, and can evaluate the advantage of the use	40	-	5	-	45



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of vitamins, feed additives, and antioxidants in veterinary use and can implement the knowledge in veterinary application.					
3. CLO3 Explain the procedure of new drug registration and the legislation governing pharmaceutical products in veterinary medicine.	10	-	-	-	10
รวม	90	-	10	-	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



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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) Riviere G.E and Papich M.G. Veterinary Pharmacology and Therapeutics. 9th ed. Ames, Iowa, Wiley-Blackwell, U.S.A. 2009
- 2) Cunningham F., Elliott J., and Lees, P. Comparative and Veterinary Pharmacology. Handbook of Experimental Pharmacology, Vol. 199. Springer-Verlag Berlin, Heidelberg, 2010.
- 3) Hsu W.H. Handbook of Veterinary Pharmacology. Wiley Backwell., Ames, Iowa, U.S.A, 2008.
- 4) Hardman JG, Goodman Gilman A, Limbird LE, ed. Goodman & Gilman's The pharmacological basis of therapeutics. 10 th ed. New York: The McGraw-Hill, 2001.
- 5) Hacker M, Bachman K, Messer W. Pharmacology principle and practice. Elsevier Inc., California; 2009.
- 6) Katzung BG. Basic and clinical pharmacology. 10th ed McGraw-Hill Companies Inc., Singapore; 2007.
- 7) Maddison JE, Page SW, Church D. Small animal clinical pharmacology. 2nd ed Saunders WB., London; 2008
- 8) Hacker M, Bachman K, Messer W. Pharmacology principle and practice. Elsevier Inc., California; 2009.

2. Suggested Materials

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3. Other Resources (if any)

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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.



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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.



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Appendix

Relations between the course and the program

Table 1 Relations between the course and the PLOs

Course Name Principles of Veterinary Phar- macology (Course Code) VSPA 327	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
	R	R						

Table 2 Relations between CLOs and PLOs

VSPA327	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1 Calculate the basic pharmaceutical parameters and describe the fundamental pharmaceutical concept, drug preparation, and drug administration. Describe the principles of pharmacokinetics, pharmacokinetic calculation, and the mechanism of pharmacological effects in animals, as well as the mechanism and consequence of	1.2	2.2						



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drug side effects on animals.								
CLO2 Describe the pharmacokinetics, pharmacodynamics, mechanism of action, clinical application, adverse drug effect, and contraindications of antipyretics, opioids, analgesics, steroids, non-steroidal anti-inflammatory drugs, autocoids, antiseptics, and disinfectants, and can evaluate the advantage of the use of vitamins, feed additives, and antioxidants in veterinary use and can implement the knowledge in veterinary application.	1.2	2.2						
CLO3 Explain the procedure of new drug registration and the legislation governing pharmaceutical products in veterinary medicine.	1.2	2.2						