



Program: Doctor of Veterinary Medicine
Course title Body structure and function IV
Course code VSPA 223

Academic degree level ☒ Bachelor ☐ Graduate Diploma ☐ Master
☐ Higher Graduate Diploma ☐ Doctor
Faculty / College / Institute: Faculty of Veterinary Science
Department: Preclinic and Apply Animal Science

TQF 3 Course Specification

Section 1 General Information

1. Course Code and Title

In Thai	สพปส ๒๒๓	โครงสร้างและการทำงานของร่างกาย ๔
In English	VSPA 223	Body structure and function IV

2. Number of Credits

4 (3-3-7)

(Theory 3 hrs. Practice 3 hrs. Self-Study 7 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: Asst. Prof. Dr. Sasitorn Rungarunlert

4.1.1 Asst. Prof. Dr. Sasitorn Rungarunlert	Department: Preclinic and Apply Animal Science
Tel. 1517	E-mail: sasitorn.run@mahidol.edu

4.1.2 Lect. Dr. Jeerawat Soonthornsit	Department: Preclinic and Apply Animal Science
Tel. 1539	E-mail: jeerawat.soo@mahidol.edu

4.2 Lecturers

1. Lect. Dr. Sakdichod Kimsakulweh
2. Lect. Dr. Jeerawat Soonthornsit
3. Asst. Prof. Dr. Sasitorn Rungarunlert
4. Asst. Prof. Dr. Ganokon Ferreira
5. Asst. Prof. Kanjana Assawasuparerk
6. Lect. Dr. Prarom Sriphavatsarakom
7. Lect. Dr. Nae Tanpradit
8. Lect. Dr. Nuttawut Nuchprayoon
9. Lect. Dr. Rapeewan Thampaisarn
10. Dr. Surapatana Leewattapisarn
11. Asst. Prof. Dr. Wanna Sirimanapong

5. Semester/Class Level

5.1 Semester 2 / Class Level 2

5.2 Number of Students Allowed Approximately 80 Students

6. Pre-requisite

VSPA220, VSPA 221

7. Co-requisites

None

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

Organize learning experiences for students.

1. Understanding of the structure of histology and the physiological mechanisms of the urinary and respiratory systems, acid-base balance, and normal animal body temperature regulation, as well as explaining and comparing the macroscopic differences of the urinary and respiratory systems in dogs, pigs, horses, and ruminants, and accurately applying the knowledge at the clinical level
2. Explain and compare the differences in body structure and function of exotic pets, poultry, aquatic animals, and horses, and accurately apply the knowledge at the clinical level.
3. Be able to process and apply knowledge obtained in VSPA 210-223 (such as body structure and function in dogs) to explain clinical problems.

2. Objectives of Course Development/Revision

2.1 Course Objectives

This course aims to provide knowledge and abilities as follows:

1. Be able to differentiate the anatomical structure of the urinary and respiratory systems in dogs, pigs, and ruminants.
2. Understand the histology and physiological mechanisms of the urinary and respiratory systems in normal animals.

3. Understand the acid-base balance and thermoregulation mechanisms in healthy animals.
4. Be able to differentiate the structure and understand the physiology of exotic pets.
5. Be able to differentiate the structure and physiology of aquatic animals.
6. Understanding the structure and physiology of poultry.
7. Understanding the structure and physiology of horses.
8. Be able to process and classify the structure and function of dogs from the content studied in VSPA 210 –223.
9. Be able to explain clinical abnormalities using knowledge of body structure and function.

2.2 Course-level Learning Outcomes: CLOs

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

1. CLO1 Compare the anatomy of the urinary system and respiratory systems accurately.
2. CLO2 Explain the histology and physiology of the urinary and respiratory systems accurately.
3. CLO3 Explain the physiology of acid-base balance and the body's thermal regulation accurately.
4. CLO4 Compare the structure and body function of exotic pets accurately.
5. CLO5 Compare the structure and body function of aquatic animal accurately.
6. CLO6 Explain the structure and body function of avian accurately.
7. CLO7 Explain the structure and body function of horse accurately.
8. CLO8 Explain the structure and body function of dogs as learned in VSPA 210 - 223 accurately.
9. CLO9 To accurately describe clinical abnormalities based on knowledge of the body's structure and function.

Section 3 Course Description and Implementation

1. Course Description

โครงสร้างและการทำงานของระบบขับถ่ายปัสสาวะ ระบบทางเดินหายใจ ดุลกรด-ด่าง และการปรับอุณหภูมิร่างกาย โครงสร้างและการทำงานของร่างกายสัตว์น้ำ สัตว์ปีก สัตว์เลี้ยงชนิดพิเศษ และม้า

Structures and functions of the urinary, respiratory systems; acid-base balance and thermoregulation; body structures and functions of aquatic animals, avian, exotic pets, and equines

2. Number of hours per semester

Theory (hours)	Practice (hours)	Self-study (hours)
45 (15 x 3)	45 (15 x 3)	105 (15 x 7)

3. Number of Hours per Week for Individual Advice

6 hours per week of appointments for instructors through course coordinators.

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 Compare the anatomy of the urinary system and respiratory systems accurately.
2. CLO2 Explain the histology and physiology of the urinary and respiratory systems accurately.
3. CLO3 Explain the physiology of acid-base balance and the body's thermal regulation accurately.
4. CLO4 Compare the structure and body function of exotic pets accurately.
5. CLO5 Compare the structure and body function of aquatic animal accurately.
6. CLO6 Explain the structure and body function of avian accurately.
7. CLO7 Explain the structure and body function of horse accurately.
8. CLO8 Explain the structure and body function of dogs as learned in VSPA 210 - 223 accurately.
9. CLO9 To accurately describe clinical abnormalities based on knowledge of the body's structure and function.

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	Demonstration	Practice	Participation	submit work on time	Group report	MCQ	SAQ	Behavior assessment in group work	Presentation
CLO1	X	X	X	X	X	X	X	X	X	X	
CLO2	X	X	X	X	X	X	X	X	X	X	
CLO3	X							X	X		
CLO4	X	X	X	X	X	X	X	X	X	X	
CLO5	X	X	X	X	X	X	X	X	X	X	
CLO6	X	X	X	X	X	X	X	X	X	X	
CLO7	X	X	X	X	X	X	X	X	X	X	
CLO8	X	X	X	X				X	X		
CLO9	X	X			X	X	X			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	Comparative anatomy of the respiratory system	3		Lecture	Dr. Sasitorn
	Comparative anatomy of the respiratory system (Practice)		5	Practice and Group discussion	Dr. Sasitorn and team
	Embryology of the urinary and respiratory system	2		Lecture	Dr. Prarom
2-3	Histology of the respiratory system	3		Lecture	Dr. Sasitorn
	Histology of the respiratory system (Practice)		6	Practice and Group discussion	Dr. Sasitorn and team
	Physiology of the respiratory system	8		Lecture	Dr. Sasitorn
	Physiology of the respiratory system (Practice)		6	Practice and Group discussion	Dr. Sakdichod and team
	Thermoregulation	3		Lecture	Dr. Prarom
4-5	Anatomy of the urinary system	2		Lecture	Dr. Kanjana
	Comparative anatomy of the urinary system (Practice)		6	Practice	Dr. Kanjana and team
	Histology of the urinary system	2		Lecture	Dr. Ganokon
	Histology of the urinary system (Practice)		5	Practice and Group discussion	Dr. Ganokon and team
	Physiology of the urinary system	8		Lecture	Dr. Ganokon
	Acid-base balance	3		Lecture	Dr. Jeerawat
6-7	Anatomy and physiology of horse	2		Lecture	Dr. Nuttawut
	Anatomy and physiology of horse (Practice)		2	Practice	Dr. Nuttawut and team
	Anatomy of avian	3		Lecture	Dr. Rapeewan
	Anatomy of avian (Practice)		5	Practice	Dr. Rapeewan Dr. Surapatana and team
	Anatomy, histology and physiology of aquatic animal	3		Lecture	Dr. Wanna
	Anatomy, histology and physiology of aquatic animal (Practice)		5	Practice	Dr. Wanna and team

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
	Anatomy and physiology of exotic pets	3		Lecture	Dr. Nae and Dr. Roschong
	Anatomy and physiology of exotic pets (Practice)		5	Practice	Dr. Nae, Dr. Roschong and team
	Total hours of the entire semester	45	45		

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)
	Group report	MCQ	SAQ	Presentation	
CLO1 Compared the anatomy of the urinary system and respiratory systems accurately	1.2	9	3.6	0	13.8
CLO2 Explain the histology and physiology of the urinary and respiratory systems accurately.	1.2	27	5.4	0	33.6
CLO3 Explain the physiology of acid- base balance and the body's thermal regulation accurately.	0	7.2	0	0	7.2
CLO4 Compare the structure and body function of exotic pets accurately.	1.2	6	3.6	0	10.8
CLO5 Compare the structure and body function of aquatic animal accurately.	1.2	6	3.6	0	10.8

Learning Outcomes	Evaluation Method*				Weight (Percentage)
	Group report	MCQ	SAQ	Presentation	
CLO6 Explain the structure and body function of avian accurately.	0.6	3	1.8	0	5.4
CLO7 Explain the structure and body function of horse accurately.	0.6	3	1.8	0	5.4
CLO8 Explain the structure and body function of dogs as learned in VSPA 210 - 223 accurately.	0	0	5	0	5
CLO9 To accurately describe clinical abnormalities based on knowledge of the body's structure and function.	3	0	0	5	8
รวม	9	61.2	24.8	5	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) Evans H.E., deLahunta A. 2000. Guide to the Dissection of the Dog: 5th edition, Saunders, Philadelphia, 378p.
- 2) Young B, Lowe J, Stevens A, Heath J, Deakin P. 2006. Wheater's Functional Histology: A Text and Colour Atlas, 5th Edition, Elsevier, USA.
- 3) Cunningham JG. 2002. Textbook of Veterinary Physiology: 3rd edition, W.B. Saunders Company, New York, 575p
- 4) Akers RM, Denbow DM. 2008. Anatomy and physiology of domestic animals. Blackwell publishing, USA.
- 5) Abraham Kierszenbaum. 2001. Histology and Cell Biology - An Introduction to Pathology. 1st edition, Mosby, USA

2. Suggested Materials

- 1) Dyce KM. Textbook of Veterinary Anatomy: 3rd edition. Saunders, New York, USA.
- 2) Cochran PE. Laboratory Manual for Comparative Veterinary Anatomy and Physiology, Delmar Learning, Canada.
- 3) Adams DR. 2004. Canine Anatomy, 4th edition, Iowa State Press, Iowa, USA.
- 4) Mescher A. 2009. Junqueira's Basic histology: Text and atlas. 12th edition, McGraw-hill medical, USA.
- 5) Guyton AC, Hall JE. 2006. Textbook of Medical Physiology: 11th edition, W.B. Saunders, New York. USA.
- 6) Ganong WF. 1997. Review Medical Physiology: 18th edition Appleton and Lange, Stamford, 839p.
- 7) <http://www.lab.anhb.uwa.edu.au/mb140/>

3. Other Resources (if any)

- 1) Teaching document of body structure and function subject
- 2) Physiology laboratory manual of body structure and function subject
- 3) Histology laboratory manual of body structure and function subject

- 4) Anatomy laboratory manual of body structure and function subject

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							
Body structure and function IV	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
(Course Code) VSPA 223	R, P							

Table 2 Relations between CLOs and PLOs

VSPA 223	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1 Compared the anatomy of the urinary system and respiratory systems accurately	X							
CLO2 Explain the histology and physiology of the urinary and respiratory systems accurately.	X							
CLO3 Explain the physiology of acid-base balance and the body's thermal regulation accurately.	X							

VSPA 223	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO4 Compare the structure and body function of exotic pets accurately.	X							
CLO5 Compare the structure and body function of aquatic animal accurately.	X							
CLO6 Explain the structure and body function of avian accurately.	X							
CLO7 Explain the structure and body function of horse accurately.	X							
CLO8 Explain the structure and body function of dogs as learned in VSPA 210 - 223 accurately.	X							
CLO9 To accurately describe clinical abnormalities based on knowledge of the body's structure and function.	X							