



Program: Doctor of Veterinary Medicine
Course title: Body Structure and Function I
Course code: VSPA 220

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

TQF 3 Course Specification

Section 1 General Information

1. Course Code and Title

In Thai สปส 220 โครงสร้างและการทำงานของร่างกาย 1
In English VSPA 220 Body structure and function I

2. Number of Credits

5 (3-6-8)
(Theory 3hrs. Practice 6. hrs. Self-Study 8 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. Kanjana Assawasuparerk Department of Preclinic and Applied
animal Science, Tel 1519, E-mail: kanjana.ass@mahidol.edu

4.2 Lecturers Asst. Prof. Kanjana Assawasuparerk
Asst. Prof. Dr. Sasitorn Rungarunlert
Asst. Prof. Dr. Ganokon Ferreira
Asst. Prof. Dr. Sakdichod Kimsakulvech
Dr. Jerrawat Soonthornsit
Dr. Parom Sriphavatsarakom
Assoc. Prof. Dr. Shutipen Buranasinsup
Mr. Somchai Sa-ing kaew
Miss Arunee Jangsangthong

5. Semester/Class Level

5.1 Semester ..1... / Class Level ..2.
5.2 Number of Students Allowed Approximately 80 Students

6. Pre-requisite

SCBI 102, SCBI 104, SCBI 123

7. Co-requisites

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

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

Day....4.....Month.....March.....Year....2020.....

Section 2 Aims and Objectives

1. Course Goals

Organized learning experiences for student

- 1.1 Comparison of embryonic developmental stages in veterinary embryology.
- 1.2 Summary of mechanisms of action in cellular physiology and apply it at the clinical level.
- 1.3 Classification of anatomy in normal dogs and apply this knowledge at the clinical level.
- 1.4 Summary of working principle of the microscope, procedure for preparing tissue slides and being able to use a microscope is correct
- 1.5 Accurately categorize the histological features in the normal animal body.
- 1.6 Summary of physiological mechanisms of muscle and hematopoietic system and apply these knowledges at the clinical level.
- 1.7 Compare the blood types of dogs, cats, pigs, horses, ruminants, poultry and reptiles.
- 1.8 Comparison of the integument system of dogs, pigs, horses, ruminants, poultry and reptiles.

2. Objectives of Course Development/Revision

2.1 Course Objectives

This course aims to provide knowledge and abilities as follows:

To provide second-year veterinary students with knowledge and understanding about the structure and function of the body at the cellular, anatomical and histological levels as well as to be aware of the nature of knowledge and technology in veterinary medicine that never stops. This will encourage learning and keep up which technological changes.

Course Objectives:

2.2 Course-level Learning Outcomes: CLOs

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

1. CLO1 Accurate comparison of embryonic stages in veterinary embryology.
2. CLO2 Describe the mechanism of action of cellular physiology accurately.
3. CLO3 Accurately classify anatomical features in normal dog's body.
4. CLO4 Shows the use of a microscope correctly.
5. CLO5 Explain the procedure for preparing histological slides accurately.
6. CLO6 Accurately characterize basal tissue histology in normal animal bodies.
7. CLO7 Explain the physiological mechanism of muscles
8. CLO8 Explain the physiological mechanism of hematopoietic system
9. CLO9 Compare the blood types of dogs, cats, pigs, horses, ruminants, poultry and reptiles correctly.
10. CLO10 Comparison of the integument system of dogs, pigs, horses, ruminants, poultry and reptiles correctly.

Section 3 Course Description and Implementation

1. Course Description

การใช้กล้องจุลทรรศน์ พื้นฐานคัพภวิทยา มหกายวิภาคศาสตร์ สรีรวิทยาระดับเซลล์ จุลกายวิภาคศาสตร์ และสรีรวิทยาของกล้ามเนื้อในสัตว์

Microscopic practice; basic embryology, anatomy, cell physiology, histology, and muscle physiology in animals

2. Number of hours per semester

Theory (hours)	Practice (hours)	Self-study (hours)
45 (15x3)	90 (15x6)	120 (15x8)

3. Number of Hours per Week for Individual Advice

Appointments for instructors through course coordinator 1 hour per week (only 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 Accurate comparison of embryonic stages in veterinary embryology.
2. CLO2 Describe the mechanism of action of cellular physiology accurately.
3. CLO3 Accurately classify anatomical features in normal dog's body.
4. CLO4 Shows the use of a microscope correctly.
5. CLO5 Explain the procedure for preparing histological slides accurately.
6. CLO6 Accurately characterize basal tissue histology in normal animal bodies.
7. CLO7 Explain the physiological mechanism of muscles
8. CLO8 Explain the physiological mechanism of hematopoietic system
9. CLO9 Compare the blood types of dogs, cats, pigs, horses, ruminants, poultry and reptiles correctly.
10. CLO10 Comparison of the integument system of dogs, pigs, horses, ruminants, poultry and reptiles correctly.

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	Demonstration	Group work	Individual work	Practice	MCQ	Practice exam	Participate in class	Individual reports	Group reports
CLO1	x					x		x		
CLO2	x					x		x		
CLO3	x	x	x		x	x	x	x		x
CLO4	x	x	x	x	x	x	x	x	x	
CLO5	x	x			x	x		x		
CLO6	x	x		x	x	x	x	x	x	
CLO7	x	x	x	x	x	x	x	x	x	
CLO8	x	x	x		x	x	x			x
CLO9	x	x		x	x	x	x	x	x	
CLO10	x	x			x	x	x	x		

SECTION 5 LESSON PLAN AND EVALUATION

1. Lesson Plan

	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		The-ory*	Prac-tice**		
1	Veterinary Embryology	3:00		Lecture: ppt/teaching documentation	Sakdi-chod
2	Cell Physiology Cell Physiology (Lab)	3:00		Lecture: ppt/teaching documentation	Ganokon / Shutipen
			3:00	Lecture: ppt/laboratory practice/micro-scope	
3	Anatomy of Bone and Joint	3:00	9:00	Lecture: ppt/teaching documentation/ laboratory practice	Parom
4	General Knowledge and Practice in Anatomy Laboratory		3:00	Lecture: ppt/Demonstration and Laboratory practice/ Anatomy Operation Manual/Dog cadaver	Somchai
5	Anatomy Canine thoracic limb	3:00		Lecture: ppt/teaching documentation	Kanjana
			15:00	Demonstration and Laboratory practice/ Anatomy Operation Manual/Dog cadaver	
6	Anatomy Canine pelvic limb	3:00	15:00	Lecture: ppt/teaching documentation/ Demonstration and Laboratory practice/ Anatomy Operation Manual/Dog cadaver	Kanjana/ Parom
7	Anatomy Canine Thoracic	3:00	3:00	Lecture: ppt/teaching documentation/ Demonstration and Laboratory practice/ Anatomy Operation Manual/Dog cadaver	Parom
8	Anatomy Canine Abdomen	3:00	6:00	Lecture: ppt/teaching documentation/ Demonstration and Laboratory practice/ Anatomy Operation Manual/Dog cadaver	Parom

	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		The-ory*	Prac-tice**		
9	Anatomy Head and neck of canine	3:00	12:00	Lecture: ppt/teaching documentation/ Demonstration and Laboratory practice/ Anatomy Operation Manual/Dog cadaver	Kanjana
10	Microscope, Preparation of tissue slides and epithelial histology	3:00	6:00	Lecture: ppt/teaching documentation/ Demonstration and Laboratory practice/ Histology Laboratory Manual/Microscope/tissue slides	Jerrawat/ Som- chai/ Arunee
11	Histology Connective tissue	3:00	3:00	Lecture: ppt/teaching documentation/ Demonstration and Laboratory practice/ Histology Laboratory Manual/Microscope/tissue slides	Jerrawat
12	Histology Bone, Cartilage and Joint	3:00	3:00	Lecture: ppt/teaching documentation/ Demonstration and Laboratory practice/ Histology Laboratory Manual/Microscope/tissue slides	Kanjana
13	Histology and Physiology of Muscle	3:00	6:00	Lecture: ppt/teaching documentation/ Demonstration and Laboratory practice/ Histology Laboratory Manual/Physiology Laboratory Manual/Microscope/tissue slides/animal model/packaged program	Sakdichod
14	Hematopoietic system	6:00	3:00	Lecture: ppt/teaching documentation/ Demonstration and Laboratory practice/ Histology Laboratory Manual/ Microscope/tissue slides/	Shutipen
15	Integument system	3:00	3:00	Lecture: ppt/teaching documentation/ Demonstration and Laboratory practice/ Histology Laboratory Manual/ Anatomy	Kanjana

	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		The-ory*	Prac-tice**		
				Operation Manual/ animal model/Microscope/tissue slides/	
	Total hours of the entire semester	45	90		

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	Practice exam	Group work	Individual work presentation	Participate in class	
CLO1 Accurate comparison of embryonic stages in veterinary embryology.	8	-	-	-	2	10
CLO2 Describe the mechanism of action of cellular physiology accurately.	8	-	-	-	2	10
CLO3 Accurately classify anatomical features in normal dog's body.	6	2	-	-	2	10
CLO4 Shows the use of a microscope correctly.	6	2	-	2	-	10

CLO5 Explain the procedure for preparing histological slides accurately.	6	2	-	-	2	10
CLO6 Accurately characterize basal tissue histology in normal animal bodies.	6	2	-	2	-	10
CLO7 Explain the physiological mechanism of muscles	6	2	-	2	-	10
CLO8 Explain the physiological mechanism of hematopoietic system	6	2	2	-	-	10
CLO9 Compare the blood types of dogs, cats, pigs, horses, ruminants, poultry and reptiles correctly.	6	2	-	-	2	10
CLO10 Comparison of the integument system of dogs, pigs, horses, ruminants, poultry and reptiles correctly.	6	2	-	-	2	10
รวม	64	16	2	6	12	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 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 6 Teaching Resources

1. Required Texts

- 1) Cunningham JG, Klein BG. Textbook of veterinary physiology. 5rd ed, Missouri: Saunders; 2012.
- 2) Dyce KM, Sack WO, Wensing CJG. Textbook of veterinary anatomy. 4rd ed. New York: Saunders; 2009.
- 3) Evans HE, deLahunta A. Guide to the dissection of the dog: 7th ed. Philadelphia: Saunders; 2009.
- 4) Guyton AC, Hall JE. Textbook of medical physiology. 12nd ed. Philadelphia: Elsevier; 2010.
- 5) McGeady TA, Quinn PJ, Fitzpatrick ES, Ryan MT. Veterinary embryology. Iowa: Wiley-Blackwell; 2006.
- 6) Reece WO. Functional anatomy and physiology of domestic animals. 4th ed. Iowa: Wiley-Blackwell; 2009.
- 7) Ross MH, Pawlina W. Histology: a text and atlas: with correlated cell and molecular biology. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2010.
- 8) Young B, Lowe JS, Stevens A, Heath JW. Wheater's functional histology: a text and colour atlas. 4th ed. Philadelphia: Churchill Livingstone; 2000.

2. Suggested Materials

- 1) Dyce KM. Textbook of Veterinary Anatomy: 4th edition. Saunders, New York, USA.
- 2) Cochran PE. Laboratory Manual for Comparative Veterinary Anatomy and Physiology, Delmar

Learning, Canada.

- 3) Evans HE. 2012. Miller's Anatomy of the Dog, 4th edition, Saunders, New York.
- 4) Mescher A. 2009. Junqueira's Basic histology: Text and atlas. 12th edition, McGraw-hill medical.
- 5) Guyton AC, Hall JE. 2010. Textbook of Medical Physiology: 12th edition, W.B. Saunders, New York.
- 6) Ganong WF. 1997. Ganong's Review Medical Physiology: 24th edition Appleton and Lange, Stamford.

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.

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 Body and Structure and Function I	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
(Course Code) VSPA 220	R ,P							

Table 2 Relations between CLOs and PLOs

(Course Code) VSPA220	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1 Accurate comparison of embryonic stages in veterinary embryology	1.2							
CLO2 Describe the mechanism of action of cellular physiology accurately.	1.2							
CLO3 Accurately classify anatomical features in normal dog's body.	1.2							
CLO4 Shows the use of a microscope correctly.	1.2							
CLO5 Explain the procedure for preparing histological slides accurately.	1.2							
CLO6 Accurately characterize basal tissue histology in normal animal bodies.	1.2							
CLO7 Explain the physiological mechanism of muscles	1.2							
CLO8 Explain the physiological mechanism of hematopoietic system	1.2							
CLO9 Compare the blood types of dogs, cats, pigs,	1.2							

horses, ruminants, poultry and reptiles correctly.								
CLO10 Comparison of the integument system of dogs, pigs, horses, ruminants, poultry and reptiles correctly.	1.2							