



Program: Doctor of Veterinary Medicine
Course title Theriogenology I
Course code VSCL 444

Academic degree level ☒ Bachelor ☐ Graduate Diploma ☐ Master
☐ Higher Graduate Diploma ☐ Doctor
Faculty / College / Institute: Faculty of Veterinary Science
Department of Clinical Sciences and Public Health

TQF 3 Course Specification

Section 1 General Information

1. Course Code and Title

In Thai	สพวค ๔๔๔	วิทยาการสืบพันธุ์ ๑
In English	VSCL 444	Theriogenology I

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	Assoc.Prof. Dr. Bunlue Kornmatitsuk Department of Clinical Sciences and Public Health Phone number 024415242 ext. 1537 e-mail bunlue.kor@mahidol.edu Assoc.Prof. Dr. Sudsajjai Kornmatitsuk Department of Clinical Sciences and Public Health Phone number 024415242 ext. 1531 e-mail sudsajjai.kor@mahidol.edu
----------------------------------	--

4.2 Lecturers	1. Assoc. Prof. Dr. Bunlue Kornmatitsuk 2. Assoc. Prof. Dr. Sudsajjai Kornmatitsuk 3. Assoc. Prof. Dr. Kampon Kaeoket 4. Assoc. Prof. Dr. Sukanya Maneein 5. Lect. Dr. Grisnarong Wongbandue 6. Assoc. Prof. Dr. Panida Chanapiwat 7. Dr. Pusprapa Jandee 8. Assist. Prof. Dr. Nawarus Prapaiwan
---------------	---

5. Semester/Class Level

5.1 Semester 1 / Class Level 4

5.2 Number of Students Allowed Approximately 80 Students

6. Pre-requisite

VSPA 222

7. Co-requisites

None

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

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

2nd March 2020

Section 2 Aims and Objectives

1. Course Goals

The students can:

1. Explain structure and function of male and female reproductive systems, breeding soundness for male and female animals, oestrous cycles and heat detection and pregnancy diagnosis in livestock (cattle and pigs) and companion animals (dogs and cats);
2. Perform semen collection and evaluation in livestock (pigs) and companion animals (dogs);
3. Explain artificial insemination technique in livestock (cattle and pigs);
4. Perform rectal palpation for examination of reproductive organs in livestock (cattle and horses);
5. Perform pregnancy diagnosis in livestock (cattle and pigs) and companion animals (dogs and cats);
6. Perform semen freezing in livestock (cattle or goats)
7. Explain artificial insemination technique and other assisted reproductive technology i.e., multiple ovulation synchronization, embryo transfer, embryo freezing, cloning and stem cells techniques.

2. Objectives of Course Development/Revision

2.1 Course Objectives

This course aims to provide knowledge and abilities as follows: Structure and function of male and female reproductive systems. Breeding soundness for male and female animals. Oestrous cycles and heat detection. Rectal palpation. Ultrasonography. Pregnancy diagnosis. Artificial insemination technique and other assisted reproductive technology.

2.2 Course-level Learning Outcomes: CLOs

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

1. CLO1 Explain structure and function of male and female reproductive systems, breeding soundness for male and female animals, oestrous cycles and heat detection and pregnancy diagnosis in livestock (cattle and pigs) and companion animals (dogs and cats).
2. CLO2 Perform rectal palpation, ultrasonography (cattle and horse) and pregnancy diagnosis in livestock (cattle and pigs) and companion animals (dogs and cats).
3. CLO3 Explain and perform semen collection and evaluation in livestock (pigs) and companion animals (dogs), semen freezing in livestock (cattle or goats), artificial insemination technique in livestock (cattle and pigs) and explain artificial insemination technique (cattle and pigs) and other assisted reproductive technology.

Section 3 Course Description and Implementation

1. Course Description

(Thai) การทำงานของระบบสืบพันธุ์ การประเมินความสมบูรณ์พันธุ์ วงรอบการเป็นสัดและการตรวจการเป็นสัด การล้วงตรวจอวัยวะสืบพันธุ์ผ่านทางทวารหนัก การตรวจอวัยวะสืบพันธุ์ภายในด้วยคลื่นเสียงความถี่สูง การตรวจวินิจฉัยการตั้งท้อง และเทคโนโลยีชีวภาพทางการสืบพันธุ์ในปศุสัตว์ และสัตว์เลี้ยง

(English) Function of the reproductive system, the breeding soundness examination, the estrous cycle and heat detection; the rectal palpation, ultrasonography of reproductive organs; pregnancy diagnosis, the reproductive biotechnology in livestock and companion animals.

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

At least 1 hour per week on Wednesday or at appointment (via electronic mail or other online platform).

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 Explain structure and function of male and female reproductive systems in dogs, cats, pigs, horses and cattle.
2. CLO2 Perform breeding soundness in male and female animals and pregnancy diagnosis in dogs, cats, pigs, horses and cattle.
3. CLO3 Explain artificial insemination technique and other assisted reproductive technology.

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 discussion	Demonstration	Practice	Sightseeing	MCQ	MEQ	Practice exams	Behavior assessment
CLO1	x	x				x	x		
CLO2			x	x	x			x	x
CLO3	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	Introduction Breeding soundness in bull	3	3	Lecture: Introduction Breeding soundness in bull Sightseeing: Semen center Demonstration: Semen collection, evaluation and freezing	Assoc. Prof. Dr. Bunlue Kornmatitsuk
2	Structure and function reproductive systems in female cattle Oestrous cycles and heat detection	3	3	Lecture: Structure and function reproductive systems in female cattle Oestrous cycles and heat detection Practice: Structure of reproductive systems in female cattle Palpation (inhouse: samples from abattoir)	Assoc. Prof. Dr. Sudsaijai Kornmatitsuk
3	Rectal palpation and ultrasonography in female cattle	3	3	Lecture: Rectal palpation and ultrasonography in female cattle Practice: Rectal palpation and ultrasonography (on farm)	Assoc. Prof. Dr. Sudsaijai Kornmatitsuk
4	Pregnancy diagnosis in female cattle	3	3	Lecture: Pregnancy and pregnancy diagnosis in female cattle Practice: Pregnancy diagnosis in female cattle (on farm)	Assoc. Prof. Dr. Bunlue Kornmatitsuk
5	Breeding soundness in male horses Assisted reproductive technology	3	3	Lecture: Breeding soundness in male horses Assisted reproductive technology Demonstration and practice: Breeding soundness in male horses Semen collection and arti-	Dr. Pusprapa Jandee

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
				cial insemination	
6	Structure and function of reproductive systems and rectal palpation in female horses	3	3	Lecture: Structure and function of reproductive systems and rectal palpation in female horses Demonstration and practice: Rectal palpation (on farm)	Dr. Pusprapa Jandee
7	Pregnancy diagnosis and parturition in female horses	3	3	Lecture: Pregnancy and parturition in female horses Demonstration and practice: Pregnancy diagnosis and ultrasonography (on farm)	Dr. Pusprapa Jandee
8	Structure and function of reproductive systems in male pigs Semen collection and evaluation	3	3	Lecture: Structure and function of reproductive systems in male pigs Semen collection and evaluation Demonstration and practice: Semen collection and evaluation	Assoc. Prof. Dr. Kampon Kaeoket Assoc. Prof. Dr. Panida Chanapiwat
9	Structure and function of reproductive systems in female pigs Pregnancy and pregnancy diagnosis Parturition and induction of parturition	3	3	Lecture: Structure and function of reproductive systems in female pigs Pregnancy and pregnancy diagnosis Parturition and induction of parturition Practice: Palpation (inhouse: samples from abattoir)	Assoc. Prof. Dr. Kampon Kaeoket Assoc. Prof. Dr. Panida Chanapiwat
10	Artificial insemination technique in pigs	3	3	Lecture: Semen collection and evaluation Artificial insemination technique in pigs Demonstration and practice: artificial insemination (on farm)	Assoc. Prof. Dr. Kampon Kaeoket Assoc. Prof. Dr. Panida Chanapiwat
11	Structure and function of reproductive systems in male	3	3	Lecture: Structure and function of reproductive	Assoc. Prof. Dr. Sukanya Maneein

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
	dogs and cats Semen collection and evaluation			systems in male dogs and cats Demonstration and practice: Semen collection and evaluation	Lect. Dr. Grisnarong Wongbandue Assist. Prof. Dr. Nawarus Prapaiwan
12	Structure and function of reproductive systems in female dogs and cats	3	3	Lecture: Structure and function of reproductive systems in female dogs and cats Practice: Vaginal cytology	Assoc. Prof. Dr. Sukanya Maneein Assist. Prof. Dr. Nawarus Prapaiwan
13	Pregnancy diagnosis Parturition and neonatal management	3	3	Lecture: Pregnancy and pregnancy diagnosis Parturition and neonatal management Demonstration (VDO) and group discussion: neonatal management	Assoc. Prof. Dr. Sukanya Maneein Assist. Prof. Dr. Nawarus Prapaiwan
14	Assisted reproductive technology I: Artificial insemination technique	3	3	Lecture: Artificial insemination technique Demonstration and practice: Preparation for artificial insemination equipments	Assoc. Prof. Dr. Bunlue Kornmatitsuk Assoc. Prof. Dr. Sudsaijai Kornmatitsuk
15	Assisted reproductive technology II: Multiple ovulation synchronization, embryo transfer, embryo freezing, cloning and stem cells techniques	3	3	Lecture: Multiple ovulation synchronization, embryo transfer, embryo freezing, cloning and stem cells techniques Demonstration (VDO) and group discussion: Multiple ovulation synchronization, embryo transfer, embryo freezing, cloning and stem cells techniques	Assoc. Prof. Dr. Bunlue Kornmatitsuk Assoc. Prof. Dr. Sudsaijai Kornmatitsuk
	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)
	MCQ	MEQ	Practice ex-ams	Behavior assessment	
CLO1 Explain structure and function of male and female reproductive systems in dogs, cats, pigs, horses and cattle	20	20	10	5	55
CLO2 Perform breeding soundness in male and female animals and pregnancy diagnosis in dogs, cats, pigs, horses and cattle.	10	-	-	-	10
CLO3 Explain artificial insemination technique and other assisted reproductive technology.	10	10	10	5	35
Total	40	30	20	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 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) พิศศักดิ์ จันทร์ประทีป, บรรลือ กรมาทิตยสุข และสุดสายใจ กรมาทิตยสุข. 2550. การจัดการและเทคโนโลยีชีวภาพด้านการสืบพันธุ์ในโคนม. สำนักพิมพ์แห่งจุฬาลงกรณ์มหาวิทยาลัย. กรุงเทพฯ. 256 หน้า.
- 2) อรรถพร คุณวรงค์ฤถ. 2545. วิทยาการสืบพันธุ์สุกร. สำนักพิมพ์แห่งจุฬาลงกรณ์มหาวิทยาลัย. กรุงเทพฯ. 408 หน้า.
- 3) Hafez, E-S.E & Hafez, B. 2000. Reproduction in Farm Animals. 7th edition. Lippincott Williams & Wilkins. Pennsylvania. 509 pp.

2. Suggested Materials

- 1) Cronje, R. 1994. The swine AI book: a field and laboratory technician's guide to artificial insemination in swine. Aitex International PTY Ltd. Victoria. 108 pp.
- 2) Noakes, D.E., Parkinson, T.J. & England, G.C.W. 2001. Arthur's veterinary reproduction and obstetrics. 8th edition. W.B. Saunders. London. 868 pp.
- 3) Peters, A.R. & Ball, P.J.H. 1995. Reproduction in Cattle. 2nd edition. Blackwell Science Ltd. Oxford. 234 pp.

- 4) Wolfgang Kahn, 1994, Veterinary reproductive ultrasonography, Mosby-Wolfe, Germany, 256 pp. Zavy, M.T. & Geisert, R.D. 1994. Embryonic mortality in domestic species. CRC Press, Inc. Boca Raton, Florida. 224 pp.

3. Other Resources (if any)

-

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 Theriogenology I (Course Code) VSCL 444	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
		R						

Table 2 Relations between CLOs and PLOs

(Course Code) VSCL 444	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1 Explain structure and function of male and female reproductive systems in dogs, cats, pigs, horses and cattle								
CLO2 Perform breeding soundness in male and female animals and pregnancy diagnosis in dogs, cats, pigs, horses and cattle.		2.1						
CLO3 Explain artificial insemination technique and other assisted reproductive technology.		2.1 2.2						