



Program: Doctor of Veterinary Medicine
Course title Laboratory of Food Safety
Course code VSCL563

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 ๕๖๓ ปฏิบัติการความปลอดภัยทางอาหาร
In English VSCL 563 Laboratory of Food Safety

2. Number of Credits

1 (0-3-1)
(Theory 0 hrs. Practice 3 hrs. Self-Study 1 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

4.1.1 Assistant Professor Dr. Natharin Ngamwongsatit
Department of Clinical Sciences and Public Health
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4.1.2 Lecturer Dr. Khuanwalai Maklon
Department of Clinical Sciences and Public Health
Contact: 02-4415242 Ext.2246 e-mail address: khuanwalai.mal@mahidol.edu

4.2 Lecturers

4.2.1 Assistant Professor Dr. Natharin Ngamwongsatit
Department of Clinical Sciences and Public Health
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4.2.2 Lecturer Dr. Khuanwalai Maklon
Department of Clinical Sciences and Public Health
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4.2.3 Lecturer Dr. Rapeewan Thampaisarn
Department of Clinical Sciences and Public Health
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4.2.4 Lecturer Dr. Dulyatad Gronsang

Department of Pre-clinic and Applied Animal Science

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4.2.5 Assistant Professor Dr. Norasuthi Bangphoomi

Department of Pre-clinic and Applied Animal Science

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4.2.6 Lecturer Dr. Nathita Phumthanakorn

Department of Pre-clinic and Applied Animal Science

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4.2.7 Associate Professor Dr. Sivapong Sungpradit

Department of Pre-clinic and Applied Animal Science

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4.2.8 Associate Professor Dr. Tanasak Changbunjong

Department of Pre-clinic and Applied Animal Science

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4.2.9 Assistant Professor Dr. Charoonluk Jirrapattanaseth

Department of Pre-clinic and Applied Animal Science

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4.2.10 Assistant Professor Dr. Boonrat Chantong

Department of Pre-clinic and Applied Animal Science

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4.2.11 Associate Professor Dr. Shutipen Buranasinsup

Department of Pre-clinic and Applied Animal Science

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4.2.12 Assistant Professor Dr. Waraphan Toniti

Department of Pre-clinic and Applied Animal Science



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4.2.13 Lecturer Dr. Karunasinee Suphaphiphat

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4.2.14 Lecturer Dr. Savek Kiatsomphob

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4.2.15 Dr. Varintip Lerdsittikul

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4.2.16 Miss Orathai Thongjuy

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4.2.17 Miss Sukanya Apiratwarrasakul

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4.2.18 Miss Anchana Chansawhang

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4.2.19 Mr. Thekhawet Weluwanarak

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4.2.20 Miss Chanokorn Chanakarn

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5. Semester/Class Level

5.1 Semester 2 / Class Level Year 5

5.2 Number of Students Allowed Approximately 80 Students

6. Pre-requisite

-not required-

7. Co-requisites

7.1 VSCL561 Food Safety 1

7.2 VSCL562 Food Safety 2

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

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

Day 23 Month June Year 2022

Section 2 Aims and Objectives

1. Course Goals

This course is designed for undergraduate students to know, understand and practice food quality measurement in the veterinary public health and interpretation according to standard criteria, be able to assess sanitary standards in the primary production, slaughter and processing of animal products in national and international.

2. Objectives of Course Development/Revision

2.1 Course Objectives

This course aims to provide knowledge and abilities as follows:

2.1.1 To explain the principle of the food quality according to standard methods



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2.1.2 To explain the primary production standard, slaughter and processing of animal products in national and international

2.2 Course-level Learning Outcomes: CLOs

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

1. CLO1 Select the effective analytical methods for biological, chemical and physical hazards from meat and animal products under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)
2. CLO2 Interpret the laboratory results to solve the problem and prevent biological, chemical and physical hazards under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)
3. CLO3 Evaluate the primary production, slaughter and processing of animal products under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)

Section 3 Course Description and Implementation

1. Course Description

เทคนิคการใช้อุปกรณ์และความปลอดภัยในห้องปฏิบัติการจุลชีววิทยาทางอาหาร ตรวจวิเคราะห์คุณภาพอาหารและน้ำ การปนเปื้อนสารเคมี สารพิษและยาปฏิชีวนะในเนื้อสัตว์และผลิตภัณฑ์จากสัตว์และคุณภาพน้ำนม มาตรฐานโรงฆ่าสัตว์ โรงงานแปรรูปเนื้อสัตว์และผลิตภัณฑ์จากสัตว์ โรงงานแปรรูปนมและผลิตภัณฑ์จากนม และห้องปฏิบัติการจุลชีววิทยาทางอาหาร

Equipment practical handling techniques and safety in food microbiology; food and water quality, chemical toxic substances analysis; the antibiotic residues contaminated in meats and their products, milk quality analysis, standard of abattoir, meats, milk, and animal products processing plants and food microbiology laboratory

2. Number of hours per semester

Theory (hours)	Practice (hours)	Self-study (hours)
0	45	15

3. Number of Hours per Week for Individual Advice

The first point of directly contact should be your Course Responsible Lecturers. Lecturers are contactable during the University day on the 2nd floor Department of Clinical Sciences and Public Health, Faculty of Veterinary Science, Monday-Friday 8.30-16.30. In an emergency, students can be contacted lecturers directly via phone or email: natharin.nga@mahidol.edu or khuanwalai.mal@mahidol.edu



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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 Select the effective analytical methods for biological, chemical and physical hazards from meat and animal products under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)
2. CLO2 Interpret the laboratory results to solve the problem and prevent biological, chemical and physical hazards under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)
3. CLO3 Evaluate the primary production, slaughter and processing of animal products under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)

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						
	Group work	Demonstration	practice	MCQ	Practice exam	Individual report	Group report	presentation	Behavior assessment	Participation
CLO1	✓	✓	✓	✓	✓	✓			✓	✓
CLO2	✓	✓	✓	✓	✓	✓		✓	✓	✓
CLO3	✓	✓	✓				✓	✓	✓	✓



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SECTION 5 LESSON PLAN AND EVALUATION

1. Lesson Plan

Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
1	Role of the veterinary public health in Thailand		3.00	Discussion/ Slide presentation	Natharin and Khuanwalai
2	Safety, contamination control and operation of instrument in veterinary public health laboratory		3.00	Demonstration and Laboratory practice Work practice in the workplace	Natharin and staff
3	Detection of water quality by total aerobic count and MPN technique		3.00	Demonstration and Laboratory practice Work practice in the workplace	Natharin and staff
4	Detection of microbial contamination in equipment and environment		3.00	Demonstration and Laboratory practice Work practice in the workplace	Khuanwalai and staff
5	Standards for food safety		3.00	Field trip/ Demonstration	Natharin and staff
6	Bacterial foodborne pathogens detection using standard method 1		3.00	Demonstration and Laboratory practice Work practice in the workplace	Natharin and staff
7	Bacterial foodborne pathogens detection using standard method 2		3.00	Demonstration and Laboratory practice Work practice in the workplace	Natharin and staff
8	Slaughterhouse and pork processing plants		3.00	Field trip/ Demonstration	Khuanwalai and staff
9	Milk and dairy product processing factories		3.00	Field trip/ Demonstration	Khuanwalai and staff
10	Milk quality analysis and anti-biotic residue in milk		3.00	Demonstration and Laboratory practice Work practice in the workplace	Natharin and staff
11	Parasite foodborne pathogen analysis		3.00	Demonstration and Laboratory practice Work practice in the workplace	Sivapong and staff
12	Chemical residue in food product using rapid test kit		3.00	Demonstration and Laboratory practice Work practice in the workplace	Khuanwalai and staff
13	Chemical residue in meat and animal products using HPLC		3.00	Demonstration and Laboratory practice Work practice in the workplace	Boonrat and staff
14	Slaughterhouse and chicken processing plants		3.00	Field trip/ Demonstration	Khuanwalai and staff
15	Special current problem		3.00	Presentation	Staff



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Teaching Period	Topics/Details	Number of hours		Methods: Teaching Media	Lecturer
		Theory*	Practice**		
	related food safety				
	Total hours of the entire semester	-	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	Practice exam	Group work	Individual work	Participation	Behavior assessment	Presentation	
CLO1 Select the effective analytical methods for biological, chemical and physical hazards from meat and animal products under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)	13.5	18	0	4.5	4.5	4.5	0	45



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CLO2 Interpret the laboratory results to solve the problem and prevent biological, chemical and physical hazards under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)	13.5	18	0	4.5	4.5	0	45
CLO3 Evaluate the primary production, slaughter and processing of animal products under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)	0	0	4	0	2	2	10
total	27	36	4	9	11	11	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) World Health Organization. Laboratory biosafety manual. 3rd ed. Geneva; 2004.
- 2) Standard Methods for the Examination of Water & Wastewater, APHA, AWWA & WEF 23rd edition, 2017 Part 9215B. Pour Plate Method and Part 9215C Spread Plate Method
- 3) ISO 6579-1:2017, First edition, Microbiology of food chain -Horizontal method for the detection, enumeration and serotyping of *Salmonella*.
- 4) ISO7218:2007, Microbiology of food and animal feeding stuffs – General requirements and guidance for microbiological examinations.
- 5) FDA Bacteriological Analytical Manual Online, January 2001. Available at <http://www.fda.gov/Food/FoodScienceResearch/LaboratoryMethods/ucm2006949.htm>



- 6) Salfinger Y and Lou Tortorello M. Compendium of methods for the microbiological examination of foods. 5th ed.
Washington: APHA; 2015.

2. Suggested Materials

-

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



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- (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 Laboratory of Food Safety	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
(Course Code) VSCL 563				P, R				



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Table 2 Relations between CLOs and PLOs

(Course Code) VSCL 563	PLOs							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CLO1 Select the effective analytical methods for biological, chemical and physical hazards from meat and animal products under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)				4.1				
CLO2 Interpret the laboratory results to solve the problem and prevent biological, chemical and physical hazards under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)				4.1				
CLO3 Evaluate the primary production, slaughter and processing of animal products under Professional standards for Veterinarian Practitioners Guideline 2009 Section 21 (1-4)				4.1				