



Program: Doctor of Veterinary Medicine  
Course title Principles of Livestock Production  
Course code VSPA 210.

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

## TQF 3 Course Specification

### Section 1 General Information

#### 1. Course Code and Title

|            |                                             |
|------------|---------------------------------------------|
| In Thai    | สพปส ๒๑๐ หลักการผลิตปศุสัตว์                |
| In English | VSPA 210 Principles of Livestock Production |

#### 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 <input checked="" type="checkbox"/> Compulsory Course <input type="checkbox"/> Electives |

#### 4. Course Coordinator and Lecturer

##### 4.1 Course Responsible Lecturers

|                                      |                                                                                 |
|--------------------------------------|---------------------------------------------------------------------------------|
| 1. Asst. Prof. Dr. Surasak Jittakhot | Department of Preclinic and Applied animal science                              |
| Tel. 086-888-9352                    | E-mail : <a href="mailto:surasak.jit@mahidol.edu">surasak.jit@mahidol.edu</a>   |
| 2. Instructor Panpanga Sangsuriya    | Department of Preclinic and Applied animal science                              |
| Tel. 082-4985-111                    | E-mail : <a href="mailto:panpanga.san@mahidol.edu">panpanga.san@mahidol.edu</a> |

##### 4.2 Lecturers

|                                           |                                                                                 |
|-------------------------------------------|---------------------------------------------------------------------------------|
| 1. Assoc. Prof. Dr. Jitkamol Thanasak     | Department of Clinical Sciences and Public Health                               |
| Tel. 081-343-4285                         | E-mail : <a href="mailto:jitkamol.tha@mahidol.edu">jitkamol.tha@mahidol.edu</a> |
| 2. Instructor Dr. Rapeewan Thampaisarn    | Department of Clinical Sciences and Public Health                               |
| Tel. 085-093-6730                         | E-mail : <a href="mailto:rapeewan.tha@mahidol.edu">rapeewan.tha@mahidol.edu</a> |
| 3. Assistant Lecturer Koramit Jenjirawatn | Department of Preclinic and Applied animal science                              |
| Tel. 086-330-1115                         | E-mail : <a href="mailto:koramit.jen@mahidol.edu">koramit.jen@mahidol.edu</a>   |
| 4. Asst. Prof. Dr. Surasak Jittakhot      | Department of Preclinic and Applied animal science                              |
| Tel. 086-888-9352                         | E-mail : <a href="mailto:surasak.jit@mahidol.edu">surasak.jit@mahidol.edu</a>   |
| 5. Instructor Panpanga Sangsuriya         | Department of Preclinic and Applied animal science                              |
| Tel. 082-4985-111                         | E-mail : <a href="mailto:panpanga.san@mahidol.edu">panpanga.san@mahidol.edu</a> |

## 5. Semester/Class Level

5.1 Semester                      1 / Class Level 2

5.2 Number of Students Allowed                      Approximately 80 Students

## 6. Pre-requisite

None

## 7. Co-requisites

None

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

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

24 June 2022

# Section 2 Aims and Objectives

## 1. Course Goals

Course provides the principles of ruminants, swine and poultry production, livestock genetic and breeding improvement, rearing management, housing management, animal identification marking, animal restraint, feeds and feeding, health management, farm sanitation, livestock production business, applied information and communication technology (ICT) for livestock production, and basic knowledge in livestock production medicine.

## 2. Objectives of Course Development/Revision

### 2.1 Course Objectives

This course aims to provide knowledge and abilities as follows:

Students are able to

1. Describe trend of livestock production business compare either local or global scale.
2. Explain characteristics of livestock production system in different species.
3. Categorize livestock breeds and their production performance in relation to rearing regimen and environment.
4. Clarify appropriate nutrition for livestock classes of age and also explain nutritional guideline of feeding to maximize livestock production.
5. Reveal the methods of livestock health management, farm sanitation system, and their production medicine.
6. Use information and communication technology (ICT) for livestock production to increase their productive efficiency.

## 2.2 Course-level Learning Outcomes: CLOs

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

1. CLO1 Explain the principles of livestock production, feeds and feeding, genetic and breeding improvement, health management, farm sanitation, rearing system and production medicine.
2. CLO2 Applied information and communication technology for livestock production to increase productive efficiency.

## Section 3 Course Description and Implementation

### 1. Course Description

หลักการผลิตสัตว์เคี้ยวเอื้อง สุกร และสัตว์ปีก สายพันธุ์ปศุสัตว์ การคัดพันธุ์ การปรับปรุงพันธุ์ การจัดการรูปแบบการเลี้ยง การจัดการโรงเรือน การทำเครื่องหมายบนตัวสัตว์ การควบคุมบังคับสัตว์ อาหารและการให้อาหาร การดูแลสุขภาพและป้องกันโรค การสุขาภิบาลในฟาร์ม ธุรกิจการผลิตปศุสัตว์ เทคโนโลยีสารสนเทศเพื่อการผลิตปศุสัตว์ ความรู้พื้นฐานด้านเวชศาสตร์การผลิตปศุสัตว์

Principles of livestock: ruminants, swine and poultry production, livestock breeds, breeding selection, breeding improvement, rearing management, housing management, animal identification marking, animal restraint, feeds and feeding, animal diseases and health management, farm sanitation, livestock production business, information technology application for livestock production, and basic knowledge for livestock production medicine.

### 2. Number of hours per semester

| Theory<br>(hours) | Practice<br>(hours) | Self-study<br>(hours) |
|-------------------|---------------------|-----------------------|
| 45                | 45                  | 105                   |

### 3. Number of Hours per Week for Individual Advice

Students are anticipated to contract via course responsible lecturer for advised 1 hour per week

## 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 the principles of livestock production, feeds and feeding, genetic and breeding improvement, health management, farm sanitation, rearing system and production medicine.
2. CLO2 Applied information and communication technology for livestock production to increase productive efficiency.

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                                     | Field trip | Workshop | Group work | MCQ                            | Group reports | Individual reports | Innovative assessment |
| CLO1 | /                                           | /          |          | /          | /                              | /             | /                  |                       |
| CLO2 |                                             |            | /        | /          |                                | /             |                    | /                     |

## SECTION 5 LESSON PLAN AND EVALUATION

### 1. Lesson Plan

| Teaching Period | Topics/Details                                                                                                                                                                                                                                                                                                                                                                       | Number of hours |            | Methods: Teaching Media              | Lecturer                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|--------------------------------------|-----------------------------------------------------|
|                 |                                                                                                                                                                                                                                                                                                                                                                                      | Theory*         | Practice** |                                      |                                                     |
| 1               | Introduction<br>- Milestone of livestock production in local and global scale<br>- Economical impact of livestock production in Thailand<br>Principle of livestock nutrition<br>- Comparative GI tract and nutrient utilization in livestock<br>- Classification of feedstuff in Thailand<br>- Nutrient and its use in livestock production<br>- Concentrate diet<br>- Roughage diet | 3:00            |            | Lecture/ Slide Presentation/ Handout | Asst. Prof. Dr. Surasak, Assistant Lecturer Koramit |

| Teaching Period | Topics/Details                                                                                                                                                                                                                                                                                  | Number of hours |            | Methods: Teaching Media                               | Lecturer                   |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|-------------------------------------------------------|----------------------------|
|                 |                                                                                                                                                                                                                                                                                                 | Theory*         | Practice** |                                                       |                            |
|                 | - Feed additive in livestock diet<br>- Feed formulation for livestock                                                                                                                                                                                                                           |                 |            |                                                       |                            |
|                 | Information and communication technology for livestock production<br>- Application for farm data record<br>Assign group work                                                                                                                                                                    |                 | 3:00       | Group work/ Group report/ Workshop                    | Assistant Lecturer Koramit |
| 2               | Principle of livestock ruminant genetic and breeding improvement                                                                                                                                                                                                                                | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Instructor Panpanga        |
|                 | Fieldtrip (1) ; Commercial dairy cattle farm                                                                                                                                                                                                                                                    |                 | 3:00       | Group work/ Group report/ Individual report/ Workshop | Topic-related lecturer     |
| 3               | Dairy cattle production<br>- Housing and restraint<br>- Farm sanitation<br>- Rearing management for calves<br>- Rearing management for heifer<br>- Rearing management for lactating cow<br>- Health management and vaccination program<br>- Disease control and prevention in dairy cattle farm | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Assoc. Prof. Dr. Jitkamol  |
|                 | Fieldtrip (2) ; Commercial dairy cattle farm                                                                                                                                                                                                                                                    |                 | 3:00       | Group work/ Group report/ Individual report/ Workshop | Topic-related lecturer     |

| Teaching Period | Topics/Details                                                                                                                                                                                                                                                                                       | Number of hours |            | Methods: Teaching Media                               | Lecturer                      |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|-------------------------------------------------------|-------------------------------|
|                 |                                                                                                                                                                                                                                                                                                      | Theory*         | Practice** |                                                       |                               |
| 4               | Feed and feeding for dairy cattle<br>- Nutrient requirement for dairy cattle<br>- Feed and feeding for calve<br>- Feed and feeding for heifer<br>- Feed and feeding for lactating cow<br>- Feed and feeding for dry cow<br>-Nutritional disorder in dairy cattle                                     | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Asst. Prof.<br>Dr. Surasak    |
|                 | Fieldtrip (3) ; Commercial beef cattle farm                                                                                                                                                                                                                                                          |                 | 3:00       | Group work/ Group report/ Individual report/ Workshop | Topic-related lecturer        |
| 5               | Beef cattle production<br>- Housing and restraint<br>- Farm sanitation<br>- Rearing management for calves<br>- Rearing management for breeding cattle<br>- Rearing management for beef cattle<br>- Health management and vaccination program<br>- Disease control and prevention in beef cattle farm | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Assistant Lecturer<br>Koramit |
|                 | Fieldtrip (4) ; Commercial beef cattle farm                                                                                                                                                                                                                                                          |                 | 3:00       | Group work/ Group report/ Individual report/ Workshop | Topic-related lecturer        |
| 6               | Goat, sheep, and buffalo production<br>- Housing and restraint<br>- Farm sanitation                                                                                                                                                                                                                  | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Assoc. Prof. Dr. Jitkamol     |

| Teaching Period | Topics/Details                                                                                                                                                                                                                                                                                                                 | Number of hours |            | Methods: Teaching Media                               | Lecturer                   |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|-------------------------------------------------------|----------------------------|
|                 |                                                                                                                                                                                                                                                                                                                                | Theory*         | Practice** |                                                       |                            |
|                 | <ul style="list-style-type: none"> <li>- Rearing management for Goat, sheep, and buffalo</li> <li>- Health management and vaccination program</li> <li>- Disease control and prevention in Goat, sheep, and buffalo farm</li> </ul>                                                                                            |                 |            |                                                       |                            |
|                 | Fieldtrip (5) ; Commercial dairy buffalo farm                                                                                                                                                                                                                                                                                  |                 | 3:00       | Group work/ Group report/ Individual report/ Workshop | Topic-related lecturer     |
| 7               | Feed and feeding for beef cattle, goat, sheep, and buffalo<br><ul style="list-style-type: none"> <li>- Nutrient requirement for beef cattle, goat, sheep, and buffalo</li> <li>- Feed and feeding for beef cattle, goat, sheep, and buffalo</li> <li>-Nutritional disorder in beef cattle, goat, sheep, and buffalo</li> </ul> | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Assistant Lecturer Koramit |
|                 | Fieldtrip (6) ; Commercial dairy buffalo farm                                                                                                                                                                                                                                                                                  |                 | 3:00       | Group work/ Group report/ Individual report/ Workshop | Topic-related lecturer     |
| 8               | Principle of swine genetic and breeding improvement                                                                                                                                                                                                                                                                            | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Instructor Panpanga        |
|                 | Fieldtrip (7) ; Commercial swine farm                                                                                                                                                                                                                                                                                          |                 | 3:00       | Group work/ Group report/ Individual report/ Workshop | Topic-related lecturer     |
| 9               | Swine production (1)<br><ul style="list-style-type: none"> <li>- Housing and restraint</li> <li>- Farm sanitation</li> <li>- Rearing management for nursery piglet</li> </ul>                                                                                                                                                  | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Instructor Panpanga        |

| Teaching Period | Topics/Details                                                                                                                                                                                                                                                       | Number of hours |            | Methods: Teaching Media                               | Lecturer                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|-------------------------------------------------------|-------------------------|
|                 |                                                                                                                                                                                                                                                                      | Theory*         | Practice** |                                                       |                         |
|                 | <ul style="list-style-type: none"> <li>- Rearing management for weaning piglet</li> <li>- Rearing management for growing pig</li> <li>- Rearing management for finishing pig</li> <li>- Rearing management for gilt</li> <li>- Rearing management for sow</li> </ul> |                 |            |                                                       |                         |
|                 | Fieldtrip (8) ; Commercial swine farm                                                                                                                                                                                                                                |                 | 3:00       | Group work/ Group report/ Individual report/ Workshop | Topic-related lecturer  |
| 10              | Swine production (2) <ul style="list-style-type: none"> <li>- Rearing management for boar</li> <li>- Rearing management for farrowing pig</li> <li>- Health management and vaccination program</li> <li>- Disease control and prevention swine farm</li> </ul>       | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Instructor Panpanga     |
|                 | Fieldtrip (9) ; Commercial poultry farm                                                                                                                                                                                                                              |                 | 3:00       | Group work/ Group report/ Individual report/ Workshop | Topic-related lecturer  |
| 11              | Feed and feeding for swine <ul style="list-style-type: none"> <li>- Nutrient requirement for swine</li> <li>- Feed and feeding for swine</li> <li>- Nutritional disorder in swine</li> </ul>                                                                         | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Asst. Prof. Dr. Surasak |
|                 | Fieldtrip (10) ; Commercial poultry farm                                                                                                                                                                                                                             |                 | 3:00       | Group work/ Group report/ Individual report/ Workshop | Topic-related lecturer  |
| 12              | Principle of poultry genetic and breeding improvement                                                                                                                                                                                                                | 3:00            |            | Lecture/ Slide Presentation/ Handout                  | Instructor Panpanga     |

| Teaching Period | Topics/Details                                                                                                                                                                                                                                                                                              | Number of hours |            | Methods: Teaching Media                | Lecturer                      |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|----------------------------------------|-------------------------------|
|                 |                                                                                                                                                                                                                                                                                                             | Theory*         | Practice** |                                        |                               |
|                 | Farm data record application presentation (1)                                                                                                                                                                                                                                                               |                 | 3:00       | Group work/ Group report/ Presentation | Topic-related lecturer        |
| 13              | Poultry production (1)<br>- Housing and restraint<br>- Farm sanitation<br>- Rearing management for layer chicken<br>- Rearing management for broiler chicken<br>- Rearing management for breeder chicken<br>- Health management and vaccination program<br>- Disease control and prevention in poultry farm | 3:00            |            | Lecture/ Slide Presentation/ Handout   | Instructor<br>Dr.<br>Rapeewan |
|                 | Farm data record application presentation (2)                                                                                                                                                                                                                                                               |                 | 3:00       | Group work/ Group report/ Presentation | Topic-related lecturer        |
| 14              | Poultry production (2)<br>- Housing and restraint<br>- Farm sanitation<br>- Rearing management for layer duck<br>- Rearing management for broiler duck<br>- Rearing management for breeder duck<br>- Health management and vaccination program<br>- Disease control and prevention in poultry farm          | 3:00            |            | Lecture/ Slide Presentation/ Handout   | Instructor<br>Dr.<br>Rapeewan |
|                 | Assigned seminar topic presentation (1)                                                                                                                                                                                                                                                                     |                 | 3:00       | Group work/ Group report/ Presentation | Topic-related lecturer        |

| Teaching Period | Topics/Details                                                                                                                                                                                                                                                        | Number of hours |            | Methods: Teaching Media                | Lecturer                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------|----------------------------------------|----------------------------|
|                 |                                                                                                                                                                                                                                                                       | Theory*         | Practice** |                                        |                            |
| 15              | Feed and feeding for poultry<br>- Nutrient requirement for poultry<br>- Feed and feeding for broiler chicken<br>- Feed and feeding for layer chicken<br>- Feed and feeding for broiler duck<br>- Feed and feeding for layer duck<br>- Nutritional disorder in poultry | 3:00            |            | Lecture/ Slide Presentation/ Handout   | Asst. Prof.<br>Dr. Surasak |
|                 | Assigned seminar topic presentation (2)                                                                                                                                                                                                                               |                 | 3:00       | Group work/ Group report/ Presentation | Topic-related lecturer     |
|                 | <b>Total hours of the entire semester</b>                                                                                                                                                                                                                             | 45:00           | 45:00      |                                        |                            |

## 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<br>(Percentage) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------|--------------------------|-----------------------------|------------------------|
|                                                                                                                                                                                       | MCQ                | Group re-<br>port | Innovative<br>assessment | Individ-<br>ual re-<br>port |                        |
| CLO1 Explain the principles of livestock production, feeds and feeding, genetic and breeding improvement, health management, farm sanitation, rearing system and production medicine. | 60                 | 5                 |                          | 10                          | 75                     |
| CLO2 Applied information and communication technology for livestock production to increase productive efficiency.                                                                     |                    | 5                 | 20                       |                             | 25                     |
| รวม                                                                                                                                                                                   | 60                 | 10                | 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 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. Acker, D. and Cunningham, M., 1998. Animal science and industry, fifth edition. Prentice-Hall, Inc, New Jersey. 704 pp.
2. Cheeke, P.R., 2005. Applied Animal Nutrition, Feed and Feeding, Third edition. Prentice-Hall, Inc, New Jersey. 676 pp.
3. National Research Council, 2001. Nutrient Requirements of Dairy Cattle, Seventh Revised Edition. National Academy of Science/National Research Council. Washington, NRC.
4. National Research Council, 2000. Nutrient Requirements of Beef Cattle, Seventh Revised Edition. National Academy of Science/National Research Council. Washington, NRC.
5. National Research Council, 1994. Nutrient Requirements of Poultry, Ninth Revised Edition. National Academy of Science/National Research Council. Washington, NRC.

### **2. Suggested Materials**

- 1) Perry, T.W., Cullison, A.E. and Lowrey, R.S. 1999. Feeds and Feeding, fifth edition. Prentice-Hall inc, New Jersey. 676 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<br>Principle of Livestock<br>production<br>(Course Code) VSPA<br>210 | PLOs |      |      |      |      |      |      |      |
|----------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|
|                                                                                  | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 | PLO7 | PLO8 |
|                                                                                  | I    | I    | I    | I    |      | I    |      |      |

**Table 2** Relations between CLOs and PLOs

| (Course Code) VSPA<br>210                                                                                                                                                             | PLOs |      |      |      |      |      |      |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|
|                                                                                                                                                                                       | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 | PLO7 | PLO8 |
| CLO1 Explain the principles of livestock production, feeds and feeding, genetic and breeding improvement, health management, farm sanitation, rearing system and production medicine. | I    | I    | I    | I    |      |      |      |      |
| CLO2 Applied information and communication technology                                                                                                                                 |      |      |      |      |      | I    |      |      |

|                                                             |  |  |  |  |  |  |  |  |
|-------------------------------------------------------------|--|--|--|--|--|--|--|--|
| for livestock production to increase productive efficiency. |  |  |  |  |  |  |  |  |
|-------------------------------------------------------------|--|--|--|--|--|--|--|--|