

**Course: Muscle Biology**

- 1. **Type** : Specialization's Elective
- 2. **Code** : PTH 6403
- 3. **Credit** : 2/0
- 4. **Semester** : Odd
- 5. **Description** :

Muscle Biology Science is encompassed in livestock development, especially in animal product processing technology that has good quality so it will not cause health problems for those who consume and the environment. This course is designed to discuss the characteristics of muscles physically, biochemically, physiologically including the quantity-quality alteration metabolism either macro or even muscle microstructure.

**6. Course Outcomes (CO)**

- CO 1 : Able to identify and formulate the muscle biology characteristics, basic science principles, muscle biology science physically, biochemically, physiologically including the quantity-quality alteration metabolism either macro or even muscle micro structure.
- CO 2 : Able to find out, evaluate, and synthesize the muscle biology science
- CO 3 : Able to apply, develop, and synthesize the information of muscle biology

**7. The Alignment Between CO and ELO**

| CO*  | ELO** |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------|-------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|      | A     |   |   |   | B |   |   | C |   |   |   | D |   |   |   |   |   |
|      | 1     | 2 | 3 | 4 | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 5 | 6 |
| CO 1 |       |   |   |   | ✓ | ✓ |   |   |   |   |   |   |   |   |   |   |   |
| CO 2 |       |   |   |   | ✓ | ✓ |   |   |   |   |   |   |   |   |   |   |   |
| CO 3 |       |   |   |   | ✓ |   |   | ✓ |   |   |   |   |   |   |   |   |   |

\*CO refers to point 6.

\*\*Expected Learning Outcomes (ELO) are written below,

|  |   |
|--|---|
| <b>A. Attitudes and Behaviors</b>  |   |
| The graduates are able to behave well, correctly, and culturally as the result of internalization and actualization of values and norms, which is reflected in a spiritual and social life through learning process, experience, research, and/or community development in the animal husbandry. |   |
| 1  | Piety to God and be able to show religious attitude and maintain the humanity values in carrying the task, which is based on religion, moral, and ethics.   |
| 2  | Be proud and love the homeland show nationalism, and contribute to the improvement of the life quality in the community, nation and country, and the advancement of civilization according to Pancasila.                              |
| 3  | Showing the social sensitivity and attention to the community and environment by respecting the culture diversity, view, religious, beliefs, and other people's opinion, and also obey the rules.                                     |
| 4  | Be accountable in carrying the professional practice that includes ability to accept accountability towards decision and professional action. It shall be according to the scope of the practice under their responsibility and laws. |
| <b>B. Mastery in Sciences</b>  |   |
| Master the theory of the current science in the animal husbandry and its application.  |   |
| 1  | Able to master the current animal science and its application theory.   |

|   |   |
|---|---|
| 2   | Able to master the livestock production science, animal nutrition and feed science, animal products technology, and the livestock social economics in relation to food security and environment.  |
| 3   | Able to master the design, management, and development of livestock research.   |
| <b>C. Special Skills</b>  |   |
| The graduates are able to develop science, technology, and arts in the animal husbandry through interdisciplinary/multidisciplinary innovative and tested research.   |   |
| 1   | Able to make innovation in the animal husbandry based on the development of science and technology.   |
| 2   | Able to design interdisciplinary and multidisciplinary research in the animal husbandry.  |
| 3   | Able to formulate and solve problems in the national development especially in terms of animal husbandry.   |
| 4   | Able to solve problems and anticipate issues in the development of animal science and industry.   |
| <b>D. General Skills</b>  |   |
| The graduates are able to manage resources by utilizing science, technology, and arts to solve problems in the animal husbandry with current science and also conduct research with accountability and full responsibility. |   |
| 1   | Able to develop logical, critical, systematic, and creative thought through scientific research, creation of design in the science and technology, which pays attention and applies humanity values according to their expertise. The graduates are able to arrange scientific concept and the study result based on the principles, procedures, and scientific ethics. |
| 2   | Able to identify the science that becomes their research object and position it to a research map by using information technology in the context of science development and expertise implementation developed through interdisciplinary or multidisciplinary approaches.   |
| 3   | Able to make a decision in the context of solving problems in the development of science and technology, which pays attention and applies humanity values based on analysis study or experiment towards information and data.   |
| 4   | Able to communicate the result of reasoning and scientific research in form of thesis and scientific writing responsibly based on academic ethics in the accredited national journal.   |
| 5   | Able to maintain the academic integrity generally and avoid the plagiarism practice.  |
| 6   | Able to communicate spoken and written English effectively by using the information technology for the development of animal science and its implementation.  |

## 8. Course Content

| Week | CO   | Topic/Subtopic                     | Learning Activity   | Assessment Tools | Allocated Time | Lecturer     |
|------|------|------------------------------------|---|------------------|----------------|--------------|
| 1    | CO 1 | Introduction                       | Classical lecture, student presentation, class discussion | Exam             | 2 x 50 minutes | Dr. Setiyono |
| 2    | CO 1 | Muscle cell growth and development | Classical lecture, student presentation, class discussion | Exam             | 2 x 50 minutes | Dr. Setiyono |

|                            |      |   |   |      |                |             |
|----------------------------|------|---|---|------|----------------|-------------|
| 3                          | CO 1 | Microstructure of muscle and adipose tissue development | Classical lecture, student presentation, class discussion | Exam | 2 x 50 minutes | Dr. Jamhari |
| 4                          | CO 1 | Lean meat technology                                    | Classical lecture, student presentation, class discussion | Exam | 2 x 50 minutes | Dr. Jamhari |
| 5                          | CO 1 | Double muscle technology                                | Classical lecture, student presentation, class discussion | Exam | 2 x 50 minutes | Dr. Edi     |
| 6                          | CO 2 | Protein synthesis and muscle development                | Classical lecture, student presentation, class discussion | Exam | 2 x 50 minutes | Dr. Edi     |
| 7                          | CO 3 | Muscular protein synthesis                              | Classical lecture, student presentation, class discussion | Exam | 2 x 50 minutes | Ir. Rusman  |
| 8                          | CO 3 | Muscular lipid synthesis technology                     | Classical lecture, student presentation, class discussion | Exam | 2 x 50 minutes | Ir. Rusman  |
| <b>Midterm Examination</b> |      |   |   |      |                |             |
| 10                         | CO 3 | Marbling synthesis technology                           | Classical lecture, student                                | Exam | 2 x 50 minutes | Dr. Endy    |

|                          |                      |                                      |  |                                   |                   |         |
|--------------------------|----------------------|--------------------------------------|--|-----------------------------------|-------------------|---------|
|                          |                      |                                      | presentation,<br>class<br>discussion                                     |                                   |                   |         |
| 11                       | CO 2<br>CO 3         | Muscle<br>conversion into<br>meat    | Classical<br>lecture,<br>student<br>presentation,<br>class<br>discussion | Exam                              | 2 x 50<br>minutes | Dr. Rio |
| 12                       | CO 3                 | Carcass handling<br>and storing      | Classical<br>lecture,<br>student<br>presentation,<br>class<br>discussion | Exam                              | 2 x 50<br>minutes | Team    |
| 13                       | CO 1<br>CO 2<br>CO 3 | Discussion and<br>paper presentation | Classical<br>lecture,<br>student<br>presentation,<br>class<br>discussion | Presentation<br>and<br>discussion | 2 x 50<br>minutes | Team    |
| 14                       | CO 1<br>CO 2<br>CO 3 | Discussion and<br>paper presentation | Classical<br>lecture,<br>student<br>presentation,<br>class<br>discussion | Presentation<br>and<br>discussion | 2 x 50<br>minutes | Team    |
| <b>Final Examination</b> |                      |                                      |  |                                   |                   |         |

### 9. Assessment

| Component    | CO               | Percentage (%) for<br>final grade | Minimum<br>Satisfactory Level |
|--------------|------------------|-----------------------------------|-------------------------------|
| Midterm      | CO 1; CO 2; CO 3 | 35                                | 70                            |
| Final exam   | CO 2; CO 3       | 35                                | 70                            |
| Assignment   | CO 1; CO 2; CO 3 | 20                                | 70                            |
| Discussion   | CO 1; CO 2; CO 3 | 10                                | 70                            |
| <b>Total</b> |                  | 100                               |                               |

### 10. Lecturer

<sup>1</sup> Dr. Ir. Setiyono, SU.

2. Ir. Edi Suryanto, M.Sc., Ph.D., IPU.
3. Dr. Ir. Jamhari, M.Agr.Sc.,IPM.
4. Ir. Rusman, M.P., Ph.D.
5. Dr. Endy Triyananto, S.Pt.,M.Eng.,IPM.
6. Dr. Rio Olympias Sujarwanta, S.Pt., M.Sc.

## 11. Reference

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10. Soeparno, 2005. *Ilmu Dan Teknologi Daging*. Cetakan Ke-4. Gadjah Mada University Press, Yogyakarta.
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12. Warris, P. D., 2001. *Meat Science. An Intoductory Text*. CAB Publ, New York.