Course: Research Techniques in Animal Products Technology

1. **Type** : Specialization's Elective
2. **Code** : PTH 6410
3. **Credit** : 2/0
4. **Semester** : Even
5. **Description** :

The course of research technique in animal product technology concerns on the planning, development and execution of research in animal food technology, the techniques of animal product research procedures.

6. **Course Outcomes (CO)**

CO 1 : Able to comprehend the sampling methods in animal product technology research.

CO 2 : Abe to comprehend several procedures of laboratory analysis in animal product technology research.

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 refers to point 6.

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

A. Attitudes and Behaviors	
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. Mastery in Sciences	
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 fed 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.
C. Special Skills	
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.

D. General Skills

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	Solution preparation	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
2	CO 1	Meat sampling technique	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
3	CO 1	Meat physical quality test	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
4	CO 1	Electrophoresis	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
5	CO 1	Principles of HPLC	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team

6	CO 1	Hydrolysis of protein	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
7	CO 1	Conventional plate count method	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
Midterm Examination						
8	CO 1	Determination of protein concentration	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
9	CO 1	Purification with SepPak C18	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
10	CO 1	Alkaline-enzyme protein purification for animal hide tanning	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
11	CO 1	Solid waste analysis	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
12	CO 1	Liquid waste analysis	Classical lecture, discussion	Midterm, final exam, participation	2 x 50 minutes	Team
13	CO 1; CO 2	Paper presentation	Presentation and discussion	Participation, discussion	2 x 50 minutes	Team
14	CO 1; CO 2	Paper presentation	Presentation and discussion	Participation, discussion	2 x 50 minutes	Team
Final Examination						

9. Assessment

Component	CO	Percentage (%) for final grade	Minimum Satisfactory Level
Midterm	CO 1; CO 2	30	70
Quiz	CO 2	10	70
Presentation	CO 2	10	70
Paper	CO 2	20	70
Final exam	CO 1; CO 2	30	70

Total	100	

10. Lecturer

1. Dr. Ir. Jamhari, S.Pt., M.Agr.Sc., IPM.
2. Ir. Rusman, M.P., Ph.D.
3. Ir. Yuny Erwanto, S.Pt., MP., Ph.D., IPM.
4. Ir. Nanung Agus Fitriyanto, S.Pt., M.Sc., Ph.D., IPM.
5. Prof. Dr. Ir. Indratiningsih, SU.
6. Widodo, S.Pt., M.Sc., Ph.D.

11. Reference

1. AOAC,2005. Official Methods of Analysis Association of Official Analytical Chemists. Benjamin Franklin Station, Washington.
2. Kerry, J, K John dan L David. 2002. Meat Processing, Improving Quality.Woodhead Publishing Limited and CRC Press LLC. England.
3. Owusu - Apenten, R. K. 2002. Food Protein Analysis. Quantitive Effects on Processing. Marcel - Dekker Inc., New York.
4. Jurnal-jurnal terkait Teknik Penelitian Teknologi Hasil Ternak.