Course: Advanced Animal Breeding
1. **Type**   : Specialization's Elective
2. **Code**   : PTR 6504
3. **Credit**   : 3/0
4. **Semester**   : Odd
5. **Description**   :

Animal breeding is course that learns the method and procedure of beef cattle breeding implementation and dairy cattle through selection and breeding with final purpose of raising the animal productivity. The material discussed encompasses various methods, selections, and breeding, selection method, elections and breeding system which is precise as an attempt for raising the genetics quality of dairy and beef cattle, selection implementation procedure and the breeding for dairy and beef cattle.

Students who have taken the course of advanced animal breeding of beef and dairy cattle are expected to be able to comprehend and explain various selection method and breeding which can be applied on dairy cattle and beef cattle population, selection implementation procedure and the breeding on a certain population of dairy cattle and beef cattle, buffalo, sheep, and goat.

6. **Course Outcomes (CO)**

CO 1   : Students are able to comprehend the concept of dairy cattle breeding, beef cattle breeding, buffalo, sheep, goat, pig.

CO 2   : Students can apply the knowledge of animal breeding of beef cattle, dairy cattle, buffalo, goat, and pig

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	Introduction • Factors affecting animal performance • The advantages of	Classical lecture and discussion		3 x 50 minutes	Prof. Dr. Ir. Sumadi, M.S., IPU.

		genetic parameter on animal breeding • Breeding value				
2	CO 1	Selection based on one-trait • Mass selection • Mass selection with repeated observation • Selection with incomplete recording • Family tree selection • Family selection • Zuriat selection	Classical lecture and discussion	Quiz	3 x 50 minutes	Prof. Dr. Ir. Sumadi, M.S., IPU.
3	CO 1	Selection towards various traits • Tandem selection • Freely-elimination selection	Classical lecture and discussion	Quiz	3 x 50 minutes	Prof. Dr. Ir. Sumadi, M.S., IPU.
4	CO 1	Cross breeding • Objective • Method • Regulation and evaluation • Review on cross breeding practices in Indonesia	Classical lecture and discussion	Quiz	3 x 50 minutes	Prof. Dr. Ir. Sumadi, M.S., IPU.

5	CO 1	Dairy cow breeding • Recording system • Dairy cow selection • Bull selection	Classical lecture and discussion	Quiz	3 x 50 minutes	Prof. Dr. Ir. Sumadi, M.S., IPU.
6	CO 1	Dairy cow breeding • Forecasting on productivity difference • Animal model • Linear classification method • Color patter on Friesian Holstein dairy cow	Classical lecture and discussion	Quiz	3 x 50 minutes	Prof. Dr. Ir. Sumadi, M.S., IPU.
Midterm Examination						
7	CO 1	Beef cattle selection • Traditional selection • Quantitative selection	Classical lecture and discussion	Paper	3 x 50 minutes	Prof. Dr. Ir. Sumadi, M.S., IPU.
8	CO 2	Beef cattle selection • Probe • Production ability • Performance test • Breeding regulation in Indonesia	Classical lecture and discussion	Paper	3 x 50 minutes	Prof. Dr. Ir. Sumadi, M.S., IPU.

	CO 2	Goat and sheep breeding • Goat and sheep selection • Cross breeding • Cross breeding evaluation • Genetic improvement • Sheep and goat in Indonesia	Classical lecture and discussion	Paper	3 x 50 minutes	Ir. Dyah Maharani S.Pt., MP., Ph.D., IPM
9						
10	CO 2	Swine breeding • Index selection • Various swine from other regions • Indigenous swine • Swine breeding in Indonesia	Classical lecture and discussion	Paper	3 x 50 minutes	Ir. Dyah Maharani S.Pt., MP., Ph.D., IPM
11	CO 1	Swine breeding • Capita selecta	Classical lecture and discussion	Paper	3 x 50 minutes	Ir. Dyah Maharani S.Pt., MP., Ph.D., IPM
12	CO 1	Molecular and genetic breeding on ruminant	Classical lecture and discussion		3 x 50 minutes	Ir. Tety Hartatik S.Pt., Ph.D., IPM
13	CO 1	Molecular and genetic breeding on non-ruminant	Classical lecture and discussion		3 x 50 minutes	Ir. Tety Hartatik S.Pt.,

						Ph.D., IPM
Final Examination						

9. Assessment

Component	CO	Percentage (%) for final grade	Minimum Satisfactory Level
Quiz	CO 1	5	70
Presentation	CO 2	5	70
Paper	CO 2	20	70
Midterm	CO 1	35	70
Final exam	CO 1	35	70
Total		100	

10. Lecturer

1. Prof. Dr. ir. Sumadi, MS., IPU.
2. Ir. Tety Hartatik, S.Pt., Ph.D,, IPM.
3. Ir. Dyah. Maharani, S.Pt., MP., Ph.D., IPM.

11. Reference

1. Hardjosubroto, W. 1994. Aplikasi Pemuliaan Ternak di Lapangan. PT. Gramedia Widiasarana, Jakarta.
2. Becker, W. A. 1992. Manual of Quantitative Genetics. Fifth Edition. Academic Enterprises. Pullman. Washington.
3. Lasley, J. F. 1978. Genetics of Livestock Improvement. Edisi Ketiga. Prentice Hall. Inc. Englewood Cliffs. New Jersey.
4. Falconer, D. S. dan T. F. C. Mackay. 1996. Introduction to Quantitative Genetics. Fourth Edition. Longman Group Ltd. Malaysia.