






**FAKULTAS PETERNAKAN
UNIVERSITAS BRAWIJAYA**
*FACULTY OF ANIMAL SCIENCE
UNIVERSITAS BRAWIJAYA*

CURRICULUM DOCUMENT

ANIMAL SCIENCES
DOCTORAL PROGRAM

2021/2022 ACADEMIC YEAR

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FOREWORD

The rapid development of science and technology in this era of globalization brings enormous changes in human life, including in the world of work. This change demands high and relevant competence in life, the needs of stakeholders including the implementation of Science and Technology. Community needs in general demand curriculum development, for universities as providers of human resources. The basis for curriculum development is the issuance of Law of the Republic of Indonesia Number 12 of 2012 concerning Higher Education, Presidential Regulation of the Republic of Indonesia Number 8 of 2012 concerning the Indonesian National Qualifications Framework (IQF), Regulation Number 49 of 2014 concerning National Standards for Higher Education, Regulation Number 3 of 2020 concerning National Standards for Higher Education and Government Regulation Number 4 of 2012 concerning the Implementation of Higher Education. Efforts to meet these demands are carried out by reviewing and compiling a curriculum that is tailored to the needs of the community so that the graduates of the Animal Science Doctoral Study Program have become relevant to the development of the demands of the world of work.

The review and preparation of the curriculum has been carried out and, in the formulation of the 2021/2022 curriculum. The curriculum is a revision and improvement of the previous curriculum. The curriculum is a guide to provide direction in the learning process to produce learning outcomes based on the Indonesian National Qualifications Framework (IQF). This Academic Paper can be a guide in carrying out the learning process at Animal Science Doctoral Study Program. Constructive input from various parties is highly expected for its improvement.

Malang, March 25th 2021

TEAM

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**DOCTORAL PROGRAM ANIMAL SCIENCE
SPECIFICATIONS**

1	Institution Name	Universitas Brawijaya
2	Study Program Name	Animal Sciences Doctoral Study Program
3	Address	Veteran Street Malang
4	Accreditation Status	No.3535/SK/BAN-PT/Akred/D/XII/2018, 28 December 2018 (Grade A)
5	Type (e.g full/part-time, residential/distance learning, dual, intensive programme)	Full-time 6 Semester
6	Degree	Dr. (Doctor)
7	Graduate learning achievement	Write down the main competencies of graduates which are the core of CPL (full explanation refers to the curriculum chapter
8	Length of Study and number of credits earned in ECTS	DPAS equalizes the number of semester credit units with <i>European Credit System</i> (ECTS) refers Higher Education Regulation no 3/2020 concerning National Standards for Higher Education. One SCU Duration of Study are 6 semester by 117,5 hours per semester.
9	Requirements for New Students	As per entry requirements
10	Starting Date of Academic Year	September – December January -August
11	Curriculum structure, learning strategy, evaluation method, etc	Outcome Base Education Curriculum, Student-centered learning, Learning Outcome Assessment
12	Standard Fee, for example: Fee per Semester /student	IDR 10,000,000
13	The date the study program specification was approved/revised	March 25 th 2021
14	Proposal Status (choose one)	Redesign/Reconstruction Results

PART I
DOCTORAL PROGRAM ANIMAL SCIENCE
SPECIFICATIONS

NAME OF STUDY PROGRAM

Doctoral Program Animal Science (DPAS)

UNIVERSITY

Universitas Brawijaya (UB)

VISION

Becoming a Pioneer and Reformer College with a Reputation International in Science and Technology, Especially those Supporting Culture-Based Industry for Community Prosperity

MISSION

1. Organizing an international standard education that produce graduates who believe and fear God Almighty, and has noble morals and character, is independent, as well as professional, and entrepreneurial spirit;
2. Carrying out the role of universities as agents of reform, pioneer and disseminator of science, technology, arts and humanities and as an agent of the nation's economic development based on the value of local wisdom and noble; and
3. Organizing superior higher education governance, fair and sustainable

DEGREE

Doctor (Dr)

ORGANIZING FACULTY

Animal Science Faculty

VISION

The vision is to become Pioneer College and Reformer with International Reputation in Science, Technology, Arts and Humanities Especially Supporting Culture-Based Industry for Prosperity Public.

MISSION

1. Organizing international standard education that produce graduates who are faithful and devoted to God Almighty, and has morals and character noble, independent, as well as professional and entrepreneurial spirit;
2. Carrying out the role of universities as agents developer and disseminator of science and technology as well as an agent of the nation's economic development by based on the value of noble local wisdom;
3. Organizing superior higher education governance, fair and sustainable

STUDY PROGRAM

VISION

To become an excellent educational institution for the Animal Science Doctoral Program nationally and internationally, and as a scientific reference center and implementation of science and technology through education and teaching, research, and community service.

MISSIONS

1. Organizing education and learning process as well as carrying out research in the field of animal science, product development and implementation in accordance with the demands of science and technology and the latest problems.

2. Publish research results nationally and internationally regularly and continuously;
3. Develop and organize scientific cooperation and its implementation with relevant parties at regional, national and global levels;
4. Develop and implement quality standardization in a sustainable manner.

EDUCATION PHILOSOPHY

Doctor of Animal Science education in FAS UB is a professional and independent resources to solve problem of food security through innovative research based on scientific with areas of discovery, a basic understanding of field and the relationship of each field to human civilization and new finding (invention).

ACADEMIC ETHIC

The academic community in carrying out the functions of their rights and obligations will not be separated of academic ethics that apply universally (honesty, openness, objectivity, lifelong learning, mutual respect and not applicable discriminatory. Academic ethics must be reflected in the teaching and learning process, research, community service, publications, the use of degrees and so on support in the form of administrative processes). Actions that violate Academic Ethics constitutes an unethical act or academic violation. Activities included in the category of unethical actions and or academic violations are prohibited acts, among others are (1) cheating/cheating in exams /cheating, (2) plagiarism, (3) jockeying, (4) forgery, (5) bribery, (6) action discriminatory, and the like

CLASS; Regular

LANGUAGE: Indonesia Language

ACCREDITATION STATUS:

No.3535/SK/BAN-PT/Akred/D/XII/2018, 28 December 2018 (Grade A)

TEACHING AND LEARNING METHODS

1. Student Center Learning, Problem Based Learning, lecturer-student interaction- the natural environment, other sources/media, Cooperative Learning.
2. Interdisciplinary approach: Interdisciplinary approach is an approach in solving a problem by using a review of various viewpoints of cognate, relevant or appropriate scientific fields in an integrated manner.
3. Multidisciplinary Approach: Multidisciplinary approach is an approach in solving a problem by using various points of view of several relevant scientific clusters.
4. Transdisciplinary Approach: Transdisciplinary approach is an approach in solving a problem by using a review of the field of science that is relatively mastered and relevant to the problem to be solved but is outside the field of science.

ENTRY REQUIREMENTS

- a. Independent Selection of UB Postgraduate Odd Semester
- b. Even Semester UB Postgraduate Independent Selection

The requirements for following the respective path are from undergraduate Animal Science Students, or other exact majors with the obligation to follow matriculation.

SCIENTIFIC CONCEPTS AND SUPPORTING TECHNOLOGY

Scientific concept by prioritizing attitude in order to develop knowledge and innovative improvement in skills

STUDY TIME AND STUDY LOAD

A minimum credit is 46 credits with a study length of 6 semesters

DISTINCTIVENESS OF STUDY PROGRAM

Distinctiveness of DPAS: Strengthening student/graduate competencies in designing research to solve livestock industry problem.

PART II

DESIGN AND DEVELOPMENT CURRICULUM

PHILOSOPHICAL FOUNDATION

The philosophical foundation underlying the development of a curriculum determines the quality of graduates (outputs) that will result from a transformation process of implementing a curriculum, in terms of the sources and contents of the curriculum, the learning process, the position of students, assessment of learning processes and outcomes, as well as student relationships. with society and the natural environment around it. The curriculum is developed with a philosophical foundation that provides the basis for the development of all potential learners to become quality Indonesian human beings listed in the national education goals. Based on this, the curriculum of DPAS was developed based on the following philosophy: (1) Education is a process of humanizing students in their human dignity. Education is at developing spiritual intelligence, emotional intelligence, intellectual intelligence, academic brilliance, through disciplined education both by instructional effect and nurturant effect; (2) Education is a cultural transformation, education is rooted in the nation's culture to build the nation's life today and in the future. Students are heirs of the nation's creative culture; (3) Education is to build a better present and future life than the past with various intellectual abilities, communication skills, social attitudes, care, and participation in building a better life for the community and nation. education is rooted in the nation's culture to build the nation's life today and in the future. Students are heirs of the nation's creative culture; (3) Education is to build a better present and future life than the past with various intellectual abilities, communication skills, social attitudes, care, and participation in building a better life for the community and nation. education is rooted in the nation's culture to build the nation's life today and in the future. Students are heirs of the nation's creative culture; (3) Education is to build a better present and future life than the past with various intellectual abilities, communication skills, social attitudes, care, and participation in building a better life for the community and nation.

THEORETICAL FOUNDATION

The theoretical basis for curriculum development is developed on the theory of standard-based education and competency-based curriculum. Education-based standards stipulate the existence of national standards as the minimum quality of education which is broken down into standards: (1) graduate competency standards, (2) learning content standards, (3) process standards, (4) learning education assessment standards ; (5) standards Lecturers and Education Personnel; (6) standard of learning facilities and infrastructure; (7). management standards; and (8) learning financing standards

The competency-based curriculum, also known as the OBE (Outcome Based Education) Curriculum, is based on the design of providing the widest possible learning experience for students in developing the ability to behave, be knowledgeable, skilled, and act responsibly.

JURIDICAL FOUNDATION

The development and preparation of the curriculum is based on the following juridical foundations: (1) the 1945 Constitution of the Republic of Indonesia; (2) Law Number 20 of 2003 concerning the National Education System; (3) Law Number 17 of 2005 concerning the National Long-Term Development Plan, along with all the provisions set forth in the National Medium-Term Development Plan; (4) Government Regulation Number 19 of 2005 concerning National Education Standards as amended by Government Regulation Number 32 of 2013 concerning Amendments to Government Regulation Number 19 of 2005 concerning National Education Standards; (5) Law Number 14 of 2005 concerning Teachers and Lecturers; (6) Presidential Regulation of the Republic of Indonesia Number 8 of 2012 concerning the Indonesian National Qualifications Framework (IQF); (7) Law Number 12 of 2012 concerning Higher Education; (8) RI Government Regulation Number 4 of 2014 concerning the Implementation and Management of Higher Education, and Regulation of the Minister of Education and Culture Number 3 of 2020.

IDEAL FOUNDATION

A good curriculum is to have the following criteria: (1). The curriculum refers to the vision and mission of UB, Faculty of Animal Sciences, and DPAS. (2). Taking into account the needs of the community (Alumni, Stakeholders, Lecturers, and Students) and the development of science, technology, culture, and art, (3). Integrated and efficient, and developed continuously. (4). Sharpen expertise and foster a conducive and comfortable academic atmosphere. DPAS curriculum meets these criteria.

The DPAS curriculum is an OBE curriculum, which brings graduates to have the profile of researchers and policymakers. This reference provides a research and technology framework, which describes the relationship between graduate study materials and elements of competence that must be achieved in implementing a research-based curriculum. The curriculum of DPAS encourages students to solve problems and make policies in a good and responsible research/scientific way.

BACKGROUND DEVELOPMENT CURRICULUM OF STUDY PROGRAM

One of the descriptions of the implementation of the Constitution of the Republic of Indonesia Year 1945 is the enactment of the Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, followed by preparation and regulation of legal products related to the implementation of the process education in Indonesia. Next, more technically followed by compiling The Ministry of National Education's Strategic Plan which includes the Vision and Mission of Education National. The vision of Indonesia's National Education is the realization of an education system as a strong and authoritative social institution to empower all citizens Indonesia has developed into a quality human being so that it can and proactively respond to the challenges of an ever-changing era. Educational Mission National are: (1) seeking to expand and equalize opportunities obtain quality education for all Indonesian people; (2) help and facilitate the development of the full potential of the nation's children from an early age until the end of life in order to create a learning society; (3) increase readiness of inputs and the quality of the educational process to optimize formation of a moral personality; (4) improve professionalism and accountability of educational institutions as a center for the cultivation of science, skills, experience, attitudes and values based on national and global standards; and (5)

empowering community participation in the implementation of education based on the principle of autonomy in the context of the Unitary State of the Republic of Indonesia. Indonesian people referred to in the vision of Indonesia's national education are: quality human beings in intellectual, spiritual, emotional, social, as well as kinesthetic (gestures) and expertise, as well as being able to face development and global competition. The quality of Indonesian people like that can be achieved through the implementation of high quality education supported by a high-quality learning process. To that end, a curriculum that is can provide direction for meaningful learning in the DPAS, with graduates having the "ability" equivalent to "learning achievement" formulated at level 9 IQF.

The higher education curriculum is defined as a set of plans and arrangements regarding competence (learning outcomes), study materials, processes, and assessment that is used as a guideline for the implementation of the study program. The curriculum is a program that is structured and implemented to achieve an educational goal. The curriculum is defined as a program in the form of: program documents and program implementation. As a document, curriculum (curriculum plan) is in the form of details of learning achievements, courses, syllabus, lesson plans, and success evaluation systems. On the other hand, curriculum as a program implementation is a form of learning that actually done (actual curriculum).

Analysis of the abilities possessed by graduates of DPAS at this time. These are the results obtained from sources of students, alumni and stakeholders who used as a consideration in preparing the curriculum to ensure graduates who have comprehensive competencies in accordance with the graduate profile (scientist/ researcher and police maker).

Formulation of profiles for graduates of DPAS to address future challenges include:

- a) There are internal challenges regarding the condition of higher education today is related to the demands of higher education which refers to 10 (ten) National Higher Education Standards. Therefore, the great challenge that faced is how to make human resources age This abundant productive resource can be transformed into a resource human beings who have competencies and skills through education so that be a productive human resource.

- b) Existence of external challenges related to globalization and various issues relating to environmental issues, advances in technology and information, the rise of the creative and cultural industries, as well as the development of education in international level. The flow of globalization will shift people's lifestyles from traditional agrarian and commercial societies into industrial and commercial societies as can be seen in the World Trade Organization (WTO), Association of South East Asian Nations (ASEAN) Community, Asia-Pacific Economic Cooperation (APEC), and the ASEAN Free Trade Area (AFTA).
- c) There is a challenge in changing the paradigm of the study program curriculum management DPAS is perfecting: (1) learning patterns that are centered on educators (Contextual Learning) into learning centered on students (Students Center Learning); (2) one-way learning pattern (interaction lecturer-student) into interactive learning (lecturer-student interaction, community-natural environment, other sources/media); (3) learning patterns intended to be cooperative learning; (4) instrumentation of learning approach to be learning based on multimedia; (5) learning patterns integrated (multi-disciplinary) in groups to strengthen development of the special potential of each student and skills special interest to students

TRACER STUDY

Method of Collecting Data

The method used in tracing graduate data (tracer study) is survey. Survey respondents are students, alumni and graduate users. Alumni are DPAS graduates. The DPAS FAS UB. While the user graduates are grouped by type of agency/non-agency, namely: a. Training and Research Center, b. Employee/User Graduate, c. Government//University

Data Collection

Data collection was carried out by distributing questionnaires to respondents. The survey was conducted for one month from 15 August -15 September 2020. The distribution of questionnaires is carried out randomly to alumni and students graduate users. Respondents do not need to write names to guarantee confidentiality and objectivity. Instrument The instrument used to collect data is a questionnaire. Questionnaire in the form of a soft file. filled in by the respondent online by accessing the link: <https://SINATRA> (alumni) and (stakeholder), Questionnaire developed by the Curriculum Evaluation Team Table 2.

(Appendix 1.) to explore information about: 1. Occupation of DPAS graduates, and 2. Improvement of Career Destination. 3. Knowledge that must be possessed by DPAS graduate to work in government/non-government agencies. 4. Soft skills that must be possessed. Data analysis Data processing is carried out in stages: 1. Data selection 2. Tabulate the data in the data recapitulation table for each group respondent 3. Counting the number of

Table 1. Development and preparation of DPAS 2021 curriculum through the following stages:

Table 1. Stages of Development and Preparation of DPAS Curriculum 2021

No	Stage	Activity	Participant	Executor
1	Curriculum Evaluation	On-going curriculum evaluation	Surveys on study programs, lecturers, student	DPAS Curriculum Development Team
		<i>Tracer Study</i> towards graduate users and stakeholders	<i>Stakeholders</i>	Team/ Study Program
		Socialization of the IQF concept, Content Standards and SNPT Process Standards and Basic Materials Studies	Study Program Curriculum Development Team, Head of Study Program, 2 lecturers	Committee
2	Development Curriculum	Composing the Profile of DPAS Graduates	Head of Faculty, Head of Study Program, Head of Interest (peminatan).	Curriculum Development Team
		Preparation of DPAS Learning Outcomes	Curriculum Development Team for Faculty Leaders, Alumni and stakeholders.	Curriculum Development Team
		Determination of DPAS Learning Outcomes	Faculty Leader, Curriculum development team	Vice Dean I and Head of Study Program
		Formation of courses based on ILOs and Study Material	Tim, Head of Interest and Lecturer	Head of Study Program
		Formation of Curriculum Structure and study load	Head of University and Leader, Vice Dean1, Head of Study Program	University Leaders, Deans, Curriculum Development Team.
		ILOs Preparation Studying	Supporting lecturer	Supporting lecturer
		Completion of curriculum documents (syllabus, lesson plans, teaching materials, assessment instrument)	Supporting lecturer	Supporting lecturer
3	Implementation, Monitoring	Implementation in Study Program	Head of Study Program, and Lecturer	Head of Study Program, and Lecturer

	and Evaluation		Support	Support
		Implementation monitoring Curriculum	Faculty Leader, Head of Study Program, QA	Curriculum Unit
		Periodic evaluation learning implementation	Head of Study Program, QA	Curriculum Unit

choices/answers based on the respondent group 4. Calculate the percentage of each option. 5. Describe the percentage in the form of a bar chart in the answer. 6. After interpreting the results of the analysis, then do informal presentation of data, namely through narrative presentation.

EXITING DPAS PROFILE

The initial step taken in the reconstruction of the DPAS curriculum is to conduct a SWOT analysis of strengths, weaknesses, opportunities and challenges and tracer studies and CSI (Community Satisfaction Index). The aim is to provide a descriptive picture of the current and future DPAS situation. DPAS has the strength (strength) most of the lecturers have the qualifications of professor (20 people), Doctoral 1 people. Based on the AIM cycle 19, it can be said that the qualifications of teaching lecturers have a score of 4, because they exceed 80% of the total lecturers. 19 people are professors. The development of lecturer competence is carried out by conducting an assessment of engineering professionals. The achievements of lecturer development show that in 2018 there were 9 lecturers who received international certification with a professional title of Asean Engineering (ASEAN Eng) and 11 people received a major professional engineer (IPU) certification, and 2 people with an IPM (intermediate professional engineer) degree. The impact of competence shows the high dedication of Higher Education Tri Dharma activities, increased publication ranking, increased book writing and community service, as well as intensive guidance to produce graduates with an average GPA of 3.9. 100% of graduates are staff of the home institution and make a positive contribution to the sending institution. The results of the analysis of CSI (Community Satisfaction Index) conducted by PPID (Information Processing and Documentation Officer) UB. DPAS has an A grade,

In an organization progress is not only seen from an increase in achievement. The progress of DPAS is supported due to the evidence finding of the weakness of an

organization, in this case DPAS has a weakness, namely the lack of equitable publications in reputable international journals, the length of study is still an average of 4.0 years while the national standard for DPAS are expected to carry out the educational process and graduate within 3 years, another weakness is the fluctuating doctoral interest.

Internal changes: Changes in the service system encourage internal changes, including the pattern of the administration system. Online services by academic staff must undergo a change in software use skills. DPAS provides technical training to improve IT skills. The conclusion of the change in QMS (Quality Management System) is only in the teaching and learning process.

Based on the letter of the Director General of Higher Education No. 363/E.E2/KR/2020 dated April 14, 2020 related to supporting the online learning process during the covid 19 pandemic. Based on the QMS, the DPAS work unit underwent external changes and with lectures required DPAS follows regulations and changes in the implementation of teaching and learning process. The implementation of lectures, student consultations with teaching staff, promoters and education staff are carried out online. DPAS also monitors online. so that to meet these needs DPAS has its own quota in the use of IT for the smooth running of the task. The implementation of DPAS student research has been hampered, but some have been overcome by online data collection. Laboratory research is a bit constrained,

The threat to DPAS is that interest in pursuing doctoral education is still low, because what requires the majority of education is education that supports careers where students have worked. However, this threat becomes an opportunity because several masters graduates are interested in continuing to doctoral programs.

After the results obtained from the SWOT analysis, tracer study, and CSI are to determine the profile of graduates, learning outcomes and studies to achieve learning outcomes. Education is carried out using the Semester Credit System (SCS).

The education system, student study load and DPAS curriculum are programmed in the form of a semester credit system, which is an education administration system using semester credit units (credits) to state the student study load, lecturer workload, learning experience, and program implementation burden.

RELEVANCE OF DEMANDS AND NEEDS STAKEHOLDERS

Tracer study shows that the 2016 curriculum is relevant to some of the demands and needs of stakeholders. Nevertheless, it is necessary to harmonize and develop a curriculum that is in accordance with the 2015 SNPT regarding the guidelines for the implementation of Study Programs. The formulation of an Outcome Base Learning (OBE)-based curriculum has been carried out by DPAS in the 2016/2017 academic year. Graduates of DPAS are expected to achieve the attitudes, knowledge and skills formulated in the achievement of spending on courses and dissertations and it is hoped that the abilities and knowledge gained have an impact on solving problems in society. Based on Law no. 2 of 2012 (Article 15) on quality assurance. Postgraduate program education is education directed at mastering and developing branches of science and technology. Therefore DPAS intended to produce graduates who are able to discover, create and/or contribute to the development of science and technology through scientific reasoning and research. Strengthening students to be wiser by increasing their ability and independence as philosophers and/or intellectuals, cultured scientists and producing and or developing theories through comprehensive and accurate research to advance human civilization.

TRACER STUDY RESULTS

Student Data

The number of respondents is 20 people. Based on the results of the questionnaire, it was found that the students of the DPAS. Figure 1. Most of fresh DPAS graduates back to their institution as a scientist or academic researcher, trainer in research center and development in livestock industry. Figure 2. Professional destination of DPAS Graduates is 40% higher position and 53% new position.

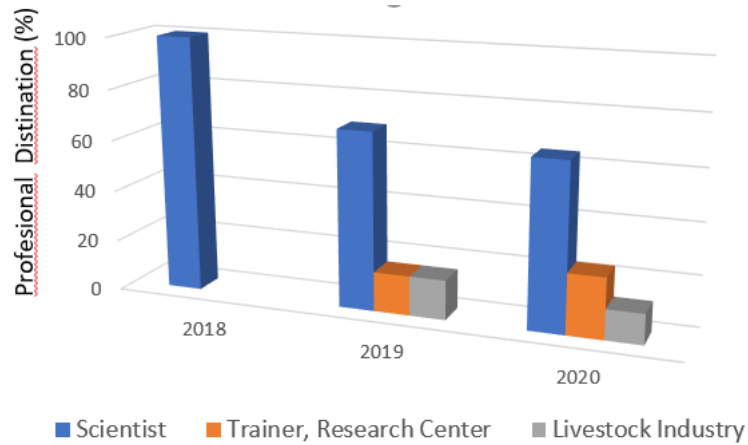


Figure 1. Professional Destination of DPAS Graduates

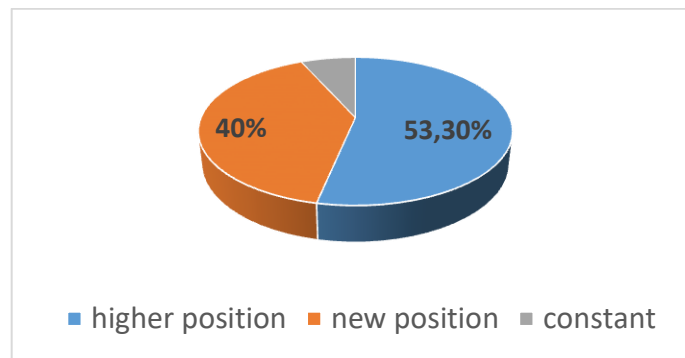


Figure 2. Exploring the career destinations of doctoral graduates

Surveys to alumni and stakeholder are utilized to determine the suitability of materials and needs required by DPAS students. Some of the questions given to alumni and graduate users are related to the courses offered along with input related to the depth of the material, questions related to the need for soft skills outside of academics, satisfaction with facilities including library facilities, IT facilities, research facilities, practicum facilities, library suggestions (accessible both offline and online) and study room facilities. Table 2. shows the response of stakeholders to academic services DPAS. Some inputs from alumni and stakeholder for improving the teaching and learning process are:

- Learning materials that must be up to date;
- Empathy for students;

- Need to add credits for practicum held in molecular/biology laboratories as an effort to increase of research effectiveness;
- Need to be improved again related to the development of networking by inviting stakeholders.

All inputs from students, alumni and stakeholder are accommodated, reviewed and action is taken to improve the quality of existing services. In addition, input from students, alumni and stakeholders is also used as a consideration in preparing the curriculum to ensure graduates who have comprehensive competencies in accordance with the graduate profile (scientist and policy maker).

Table 1. Stakeholders's responses to academic services at DPAS

Competence	DPAS	
	S	VS
Curriculum	24	76
Compulsory courses	18	82
Elective courses	25	75
Practice	21	79
Structured Tasks	25	75
Field study	33	87
Lecturer competence in teaching	5	95
Lecturer competence in guiding	7	93
Learning facilities	12	88
Practice facilities	13	87
Research facilities	17	83
Library facilities	16	84
IT facilities	15	85
Study room facilities	20	80

Note: VS: Very satisfied; S: satisfie; The number is in percentage (%)

FAS provides opportunities for the entire academic community and the public to obtain information and transparency needed in managing public resources. All information

Recommendation Some expectations and recommendations from students for process improvement teaching and learning are: 1) Laboratory facility improvement to support DPAS student research. 2) Fostering academic writing for international publication.

ALUMNI AND STAKEHOLDER DATA

The number of respondents is 20 people, Fields of work of alumni and stakeholders are grouped into 3, namely: College/School or university, Research Center/ Ministry

of Agriculture, Industry Livestock, Entrepreneur, and others. Percentage of occupations that carried out by alumni of PDAS is presented in Figure 1.

CONCLUSION OF TRACER STUDY

Based on the descriptive analysis of the tracer study data above, the profile is determined Graduates of DPAS are Scientists and policy maker

PART III

FORMULATION OF LEARNING OUTCOME DOCTOR PROGRAM ANIMAL SCIENCE

PROCESS OF LEARNING OUTCOMES FORMULATION

Indonesia Quality Assurance Framework considerations are the determination domain of intended learning outcome (ILOs) are (1) attitudes, (2) knowledge, (3) skills special skills, and (4) general skills, but also added on consideration learning outcomes of study programs which are generally determined by the institution international accreditation. The ILOs must also be in line with the objectives of the study program measurable, and the profile of the graduates of the study program (graduate attribute) determined by each study program.)

Preparation of ILOs based on several considerations from stakeholders, UB, and faculties both from lecturers, education staff, students, alumni, graduate users and international accreditation guidelines AQAS (Agency for Quality Assurance through the Accreditation of Study Programs). The formulation of the ILOs of DPAS through several stages: includes curriculum evaluation, and curriculum development. Curriculum evaluation includes on-going curriculum evaluation activities through surveys on study program, lecturers and students. Followed by doing Tracer Study of graduate users and stakeholders, then carry out Socialization of the IQF concept, Content Standards and High Education Nasional Standard Process Standards and Basic Materials Studies by the Study Program Curriculum Development Team, Head of DPAS, and postgraduate lecturer. The curriculum development team includes the Preparation of Graduate Profiles, Preparation of ILOs and Determining the ILOs are evaluated every four years in order to adapt to the latest technological developments, rules/policies government, stakeholder demands and national and international accreditation.

EDUCATIAN OBJECTIVES

Produce doctoral graduates who have the following competencies and qualifications:

1. Having noble ethics, having the spirit of Pancasila, and having high integrity and scientific spirit as well as being sensitive, open and responsive to the

development of science and technology for solving problems in the livestock sector;

2. Having a graduate profile as a researcher and expert in the field of animal science; as a developer of science and technology, and as a policy maker;
3. Able to design, perform, develop and apply the latest science and technology in accordance with the demands of society;
4. Able to publish scientific works both nationally and internationally recognized by the scientific community in order to provide an active role and contribution to the development of science and technology broadly.
5. Able to develop cooperation with other agencies both at home and abroad and implement it responsibly, dynamically and sustainably.

GOALS AND STRATEGIES

The DPAS sets four strategic issues as the main targets, namely (1) the competence of graduates who have independence in thinking and developing science and technology, (2) the relevance and quality of research, who play an active role in conducting innovative research independently or in groups, (3) the quality of community service, which is always creative in serving and applying science and technology according to the needs of the community dynamically; and (4) institutional cooperation, cooperation with other parties at home and abroad. The strategy for achieving and developing the four strategic issues is translated into four areas which include: (A) Education and Student Affairs Development, (B) Research Development, (C) Community Service Development, (D) Institutional Cooperation Development.

GRADUATE PROFILE

The DPAS has a program to create graduates with the following profile:

1. As a researcher and developer of science and technology with quality, integrity, and responsibility and able to implement and communicate scientific work at national and international levels to solve problems in society and play an active role in the development of science and technology.
2. As experts in policy maker.

FORMULATING LEARNING OUTCOMES

Table 2. Standard qualification for DPAS graduate at level 9. The Implementation in Curriculum Preparation in DPAS refers to the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 73 of 2013 concerning the Implementation of the IQF for Higher Education and the Ministry of Research 3 of 2020 as shown in Table 2:

Table 2. Description of IQF level 9

Description of IQF Level 9	
1	Capable of cultivating new knowledge, technology, or/and art within her/his expertise's or professional domain through research; producing creative, original and reputable creations
2	Capable of solving science, technology or/and art problems within her/his scientific expertise through inter-, multi- and trans-discipline approach.
3	Capable of organizing, leading and cultivating research and development useful to science and valuable to human civilization as well as obtain national and international recognition.

The review of the DPAS curriculum which was carried out in the 2015/2016 Academic Year, resulted in a curriculum that was valid in the 2016/2017 odd semester, changes to learning study materials. This review is in accordance with level 9 learning outcomes referring to PP number 8 of 2012 concerning IQF. Reconstruction of the curriculum in the 2020/2021 academic year, is to refine it on the basis of the following considerations:

1. Adjustment to the development of science and technology that occurs continuously.
2. Increasing scientific specifications for participants of DPAS.
3. Review of profiles, graduate competencies and development of assessments of learning processes and outcomes that are tailored to learning outcomes-based education.

4. Improving the quality and efficiency of the management of DPAS.

The number of credits (Semester Credit units) or study load that must be taken by students to complete DPAS is:

1. For participants who have a master's degree (S2) in a same field, the amount is 46 credits, consisting of 18 credits of structured lectures and assignments and 28 credits of a Dissertation.
2. For participants with master's degree education (S2) not in a same field, the minimum is 46 credits, consisting of lectures and structured assignments 18 credits and a dissertation of 28 credits and matriculation 6 credits equivalence with 2 subjects in master program.

One SCU is determined based on lecturing activity load, including lectures, structured assignments, and independent study. One SCU equals 440 minutes per week per semester or 117.3 hours per semester and, meanwhile, in Germany, one ECTS equals 30 hours. The conversion of SCU to ECTS (117.3 : 30). The table below has shown the conversion of SCU to ECTS.

Student academic activities in completing the study load independently The outline consists of lecture and dissertation activities, where the weight of each activity is measured in semester credit units or credits, which are described as follows.

1. Lecture activities

Lecture activities are mainly carried out in semester I and/or semester II with a total of 18 credits. Lecture activities consist of lectures and structured assignments. Courses consist of compulsory courses and elective courses. Compulsory courses must be taken by all students of DPAS, while the elective courses taken by students are adjusted to the interests and topics of the dissertation research. The elective courses taken by students can be in the form of courses organized by other study programs or with the approval/assignment of the Promoter. The number of face-to-face meetings for each course is 14-16 times per semester, excluding exams.

2. Dissertation Activities

The dissertation activities consist of writing research proposals, research proposal feasibility tests, conducting research, research results seminars, publishing articles, writing dissertations and dissertation feasibility tests (closed and open).

The number of credits for dissertation activities is 28 credits consisting of the following components: proposal, reasearch, seminar and publication.

CURRICULUM RELATIONSHIP WITH FACULTY GOALS

The DPAS curriculum is an implementation of educational goals as stated in the Academic Handbook where the purpose of education is to produce professional doctors who fear God Almighty, have a Pancasila spirit, master scientific basics and skills in the field of animal Sciences, are able to apply science and technology in the field of animal Sciences, able to work in the field of animal Sciences, able to behave and behave in social life, and able to always follow the development of science and technology in the field of animal Sciences. The role of Doctors in the field and the demands of technological developments, graduates of DPAS are expected to have profiles as: Researcher and policy maker.

The achievement of the profile can be achieved by several categories of learning outcomes including the main competencies, supporting competencies and other competencies. Learning Outcomes for each semester are formulated in Figure 3. The types of competencies that must be presented are in Table 3. The length of study to complete Education at DPAS can be taken for 6 semesters and a maximum of 14 semesters. In semester I and II, DPAS students can take lectures by programming compulsory and elective courses (according to interests), students are

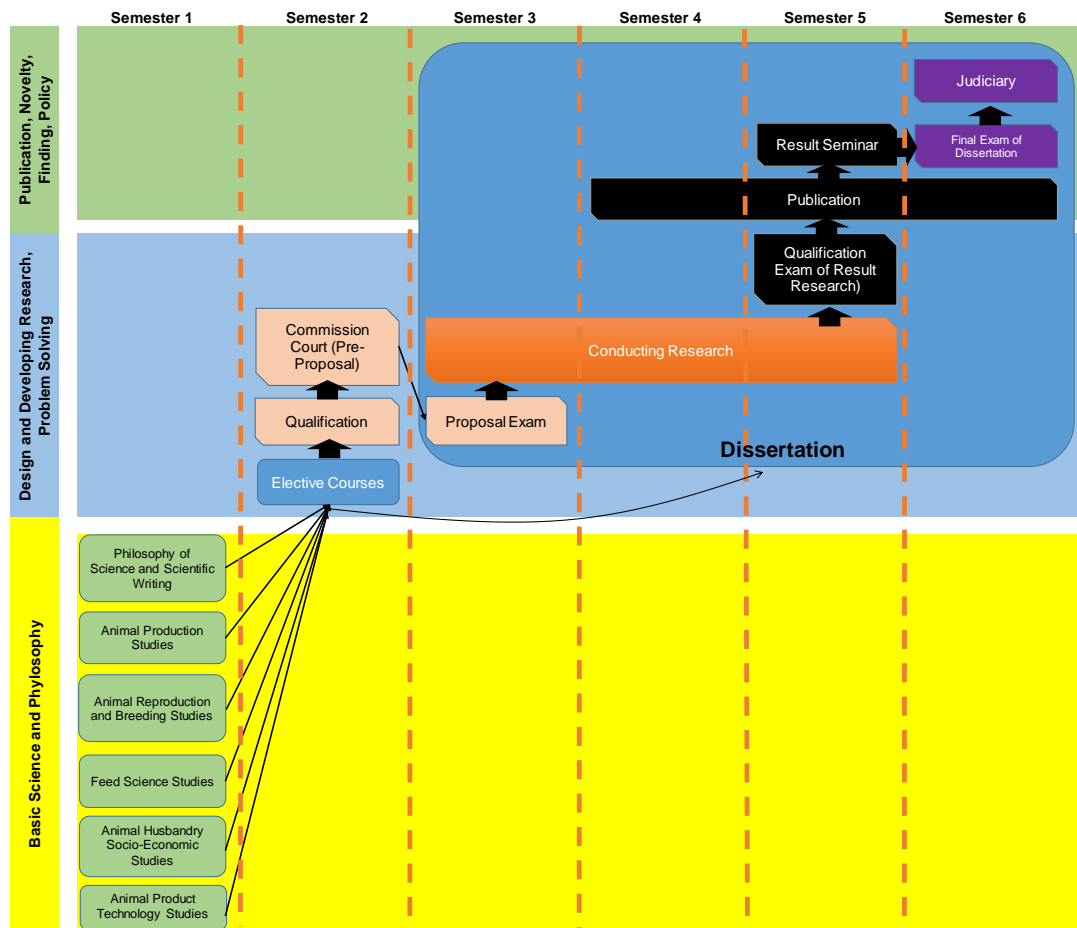


Figure 1. Learning outcomes for each semester

Table 3. Intended Learning Outcome

COMPETENCE	LEARNING ACHIEVEMENTS			
	ATTITUDE COMPETENCE	KNOWLEDGE COMPETENCE	GENERAL COMPETENCY	SPECIAL SKILL
MAIN COMPETENCES	ILO1 Able to intervene in livestock issues at the macro level	ILO2 Mastering the theoretical philosophy in the field of animal Sciences that is relevant to intervention in livestock problems	ILO3 Able to expand and deepen new livestock theory through multi and transdisciplinary approaches to contribute to the achievement of the vision and mission of DPAS FAS UB.	ILO4 Able to contribute in the formulation of policies related to social welfare at the macro level through livestock development
SUPPORTING COMPETENCY		ILO5 Finding or developing scientific theories/conceptions/ideas, and contributing to the development and practice of science and/or technology in the	ILO6 Develop a research roadmap with an inter, multi, or transdisciplinary approach, based on a study of the main research objectives and relationships with	ILO7 Compile a dissertation based on the results of in-depth, multi- or trans-disciplinary research that has been carried out including theoretical

		field of animal Sciences based on scientific methodologies, logical, critical, systematic, and creative thinking	broader objectives	and/or experimental studies in the fields of science, technology, art and the resulting innovations
			ILO8 Publish the results of research in the field of science in scientific journals that are accredited nationally and internationally, unless there are special restrictions from the grantor of research that require data security and confidentiality	ILO9 Choose appropriate, current and advanced research and provide benefits to mankind through an inter, multi, or transdisciplinary approach, to develop and/or produce problem solving in the fields of science, technology, and art,
COMPETENCE	LEARNING ACHIEVEMENTS			
	ATTITUDE COMPETENCE	KNOWLEDGE COMPETENCE	GENERAL COMPETENCY	SPECIAL SKILL
OTHER COMPETENCES	ILO10 Demonstrate academic leadership and develop collegial relationships in managing, developing and fostering resources and organizations under their responsibility as well as communities outside the institution			

allowed to take courses in other study program to support research with the recommendation of the Promoter and Head of DPAS. The learning objective at semester I and II provide basic concepts and development of knowledge and science. Semester III, IV and V conduct research and publication.

GRADUATE PROFILES AND GRADUATE COMPETENCIES

The graduate profile contains the roles that are expected to be carried out by graduates of the study program in society/the world of work. This profile is *outcome* which is the goal of the DPAS study program. The graduate profile that has been set in DPAS is a guarantee of learning achievement for prospective students during the learning process according to the profile in DPAS, namely researchers and policy

makers. The competency matrix and profile of DPAS graduates are presented in Table 4.

Table 4. Competency matrix, profile of DPAS-FPt UB graduates

Learning Outcomes	ILOs	Competence	Researcher (Researcher)	Policy makers
Main Competencies		Attitude competence:		
	ILO1	Able to intervene in livestock issues at the macro level	o	o
		Knowledge competence		
	ILO2	Mastering the theoretical philosophy of the relevant livestock field to intervene in livestock problems	o	o
		General competence		
	ILO3	Able to expand and deepen new livestock theory through multi and transdisciplinary approaches to contribute to the achievement of the vision and mission of DPAS FPt UB.	o	o
		Special competence		
	ILO4	Able to contribute in the formulation of policies related to social welfare at the macro level through livestock development		o
Supporting competence		Knowledge competence		
	ILO5	Finding or developing scientific theories/conceptions/ideas, and contributing to the development and practice of science and/or technology in the field of animal Sciences based on scientific methodologies, logical, critical, systematic, and creative thinking	o	o
		General competence		
	ILO6	Develop a research roadmap with an inter, multi, or transdisciplinary approach, based on a study of the main research objectives and relationships with broader objectives	o	
	ILO7	Compile a dissertation based on the results of in-depth, multi- or trans-disciplinary research that has been carried out including theoretical and/or experimental studies in the fields of science, technology, art and the resulting innovations	o	o
	ILO8	Publish the results of research in the field of science in scientific journals that are accredited nationally and internationally, unless there are special restrictions from the grantor of research that require data security and confidentiality	o	
			Special Skill Competence	
	ILO9	Choose appropriate, current and advanced research and provide benefits to mankind through an inter, multi, or transdisciplinary approach, to develop and/or produce problem solving in the fields of science, technology, and art,	o	
Other competencies		Other competencies		
	ILO10	Demonstrate academic leadership and develop collegial relationships in managing, developing and fostering resources and organizations under their responsibility as well as communities outside the institution	o	

CURRICULUM STRUCTURE AND CONTENT

Changes in the 2010 curriculum to 2016 curriculum. Further reconstruction in 2021 is shown in Table 5. The DPAS curriculum adapts to technological developments and stakeholder needs. The content of the DPAS curriculum includes the integration of cognitive, psychomotor and affective aspects. The weighting is related to the number of credits that cover the three aspects that are balanced. The DPAS curriculum is designed based on the objectives, scope, depth of material, and organization that leads to the formation of hard skills and soft skills that can be applied in various situations and conditions. In general, the scope of the curriculum includes:

1. Competence
2. Learning material/content
3. Learning Resources
4. Learning strategies and methods
5. Study load and period
6. Learning outcomes evaluation system

The study program is the main person responsible for creating, developing, revising, and implementing the curriculum. The Faculty Senate is the main person responsible for determining the effectiveness of curriculum implementation at the Faculty level. The result of curriculum reconstruction that adapts to the development of science and technology is the change of courses in DPAS according to the following Table 5:

Table 5. Reconstruction of DPAS

No.	No. MK	MK name	MK New/Old/Delete	Changes to		Reason for Review	On Proposals / Feedback from	Valid from Sem./Year
				Syllabus/SAP	Text books			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	PEF-90000	Philosophy of Science and scientific writing	long	V	-	Enrichment of teaching materials and adjustments to the competence of IQF level 9	Lecturers, Alumni and Users	Odd 2016/2017
2	PEP 91001	Animal Production Studies	long	V	-	Adapted to the competence of IQF level 9 and the development of science	Lecturers, Alumni and Users	Odd 2016/2017
3	PER 9202	Animal Reproduction and Breeding Studies	long	V	-	Adapted to the competence of IQF level 9 and the development of science	Lecturers, Alumni and Users	Odd 2016/2017
4	PEM 93001	Animal Feed Studies	long	V	-	Adapted to the competence of IQF level 9 and the development of science	Lecturers, Alumni and Users	Odd 2016/2017
5	PES 94001	Animal Husbandry Socio-Economic Study	long	V	-	Adapted to the competence of IQF level 9 and the development of science	Lecturers, Alumni and Users	Odd 2016/2017
6	PET 95001	Animal Product Technology Study	long	V	-	Adapted to the competence of IQF level 9 and the development of science	Lecturers, Alumni and Users	Odd 2016/2017
7	PEP 91002	Production of Non-Ruminant and Miscellaneous Animal Strategy	New	V	-	Enrichment of insight	Lecturers, Alumni and Users	Odd 2021/2022
8	PEP 91003	Ruminant Production Strategy	New	V	-	Enrichment of insight	Lecturers, Alumni and Users	Odd 2021/2022
9	PER 9202	Animal Reproductive Biology	New	V	-	Enrichment of insight	Lecturers, Alumni and Users	Odd 2021/2022
10	PER 92003	Animal Genetic Quality Improvement Strategy	New	V	-	Enrichment of insight	Lecturers, Alumni and Users	Odd 2021/2022
11	PEM 93002	<i>Small Project</i> Non Ruminant	New	V	-	Competency improvement	Lecturers, Alumni and Users	Odd 2021/2022

No.	No. MK	MK name	MK New/Old/Delete	Changes to		Reason for Review	On Proposals / Feedback from	Valid from Sem./Year .
				Syllabus/SAP	Text books			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
12	PEM 93003	<i>Small Project</i> Ruminants, and Forages	New	V		Competency improvement	Lecturers, Alumni and Users	Odd 2021/2022
13	PES 94002	Analysis and synthesis of Livestock Agribusiness development	New	V	-	Competency improvement	Lecturers, Alumni and Users	Odd 2021/2022
14	PES 94003	Digital-Based Livestock Agribusiness	New	V		Competency improvement	Lecturers, Alumni and Users	Odd 2021/2022
15	PET 94002	Animal Product Technology Development	Long	V	-	Enrichment of teaching materials	Lecturers, Alumni and Users	Odd 2016/2017
16	PET 94003	Animal Product Bioprocess Technology	New	V	-	Enrichment of teaching materials	Lecturers, Alumni and Users	Odd 2021/2022

Course Code Description:

Provide a new code for the Constitutional Court in accordance with IQF level 9 example PEP 910001. PEF (code 0): Faculty of Animal Sciences, PEP (code 1): Interest in Livestock Production, PER (code 2): Interest in Livestock Reproduction, PEM (code 3): Interest in Nutrition and Livestock Food, PES (code 5): Interest in Socio-Economic Animal Sciences (code 6): Interest in Livestock Products Technology, Number 94003 explains: first digit 9: IQF level for S3 level 9, second digit indicates interest, digit 3,4 and 5 shows the course code.

Table 6. Course Matrix (CM) with Learning Outcomes

Smt	MK code	Course Name * (Must)	Credits weight	Study Program Learning Outcomes										Total	%
				ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7	ILO8	ILO9	ILO10		
I/II	PEF 90000	Philosophy of Science and scientific writing	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						5	5.68
I/II	PEP 91001	Animal Production Studies	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					6	6.81
I/II	PER 92001	Animal Reproduction and Breeding Studies	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10	8.88
I/II	PEM 93001	Animal Feed Studies	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						5	5.68
I/II	PES 94001	Animal Husbandry Socio-Economic Study	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>						4	4.54
I/II	PET 94001	Animal Product Technology Study	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>						4	4.54
		Sub-Total	18												
		(*Choice)													
I/II	PEP 91002	Production of Non-Ruminant and Miscellaneous Animal Strategy	2	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>					4	4.54
I/II	PEP 91003	Ruminant Production Strategy	2	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>					4	4.54
I/II	PER 9202	Animal Reproductive Biology	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>						4	4.54
I/II	PER 92003	Animal Genetic Quality Improvement Strategy	2	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						4	4.54
I/II	PEM 93002	<i>Small Project</i> Non Ruminant	2	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		4	4.54

Smt	MK code	Course Name * (Must)	Credits weight												

I/II	PEM 93003	<i>Small Project</i> Ruminants, and Forages	2	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>		4	4.54
I/II	PES 94002	Analysis and synthesis of Livestock Agribusiness development	2	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	4	4.54
I/II	PES 94003	Digital-Based Livestock Agribusiness	2	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>				<input type="checkbox"/>	4	4.54
I/II	PET 95002	Animal Product Technology Development	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>						4	4.54
I/II	PET 95003	Animal Product Bioprocess Technology	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>						4	4.54
	PEF 90001	Seminar	4								<input type="checkbox"/>		<input type="checkbox"/>	2	2.27
	PEF 9000	Publication	12								<input type="checkbox"/>		<input type="checkbox"/>	2	2.27
	PEF 90002	Dissertation	32	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10	8.88
		TOTAL	92	17	10	13	6	17	9	2	4	4	6	88	100
		Percentage (%)		19.31	11.36	14.77	6.81	19.31	10.22	2.27	4.54	4.54	6.81	100	

SYLLABUS AND COURSE LEARNING OUTCOMES (CLO)

The syllabus of courses in DPAS is listed as follows Table 7:

Table 7. The syllabus of courses in DPAS

No	Code	Course Name	Course Description and Course Learning Outcomes (CP-MK)
1	PEF 90000	Philosophy of Science and Scientific Writing (3 X 0 credits)	<p>Description Reviewing and providing an understanding of the philosophy of science and theory of truth, describing critical thinking-analysis of knowledge to be reasoned deductively and inductively, understanding the nature and meaning of research, as well as strategies for preparing proposals and research reports that are reliable based on the principles of writing scientific papers that are good and right</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Students are able to think critically, creatively and analyze the truth of theories based on the philosophy of science 2. Students are able to reason with the knowledge gained and make deductive and inductive conclusions 3. Students are able to prepare proposals and dissertation research reports according to their nature and meaning 4. Students are able to write good and correct scientific papers, and have a commitment to norms and ethics in scientific studies
2	PEP 91001	Animal Production Studies (3 X 0 credits)	<p>Description The subject of Livestock Production System Science and Studies aims to provide an understanding of livestock production system policies as an aspect of national development studies in terms of fulfilling food adequacy of animal origin in terms of current scientific and technological principles as well as overall achievement methods. Discussion and emergence of ideas or innovations using basic knowledge of concepts, scientific theory is needed as a basis for reviewing regulations that apply to national development goals, logical prospective studies and follow-up on weaknesses and strengths of livestock production systems</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Able to formulate problems, formulate hypotheses, and research methods of livestock production according to the field of science that is occupied. 2. Able to conduct a written study of the policy of the livestock production system in national development which aims to fulfill the adequacy of food originating from livestock. 3. Students are able to collect, process data and interpret results logically and systematically written in scientific language
3	PER 92001	Animal Reproduction and Breeding Study (3 X 0 credits)	<p>Description This course discusses the concept of Livestock Reproduction and Breeding including the implementation of Reproduction in the development and population of livestock, The role of reproductive technology for increasing livestock productivity, overcoming reproductive disorders for increasing livestock populations, implementing breeding designs/programs in improving genetic quality and livestock performance, the role of breeding programs in the management of livestock genetic resources, strategies for improving genetic quality for several important traits in livestock and Implementation of biotech in livestock breeding</p> <p>CLO</p>

		<ol style="list-style-type: none"> 1. Mastering the basic concepts of the study of Animal Reproduction and Breeding 2. Able to apply strategies for utilizing reproductive technology and livestock breeding for livestock development 3. Skilled in communicating concepts and studies in scientific writing in the field of livestock reproduction and breeding
4	PEM 93001	<p>Animal Feed Studies (3 X 0 credits)</p> <p>Description Discusses the philosophy of logic of animal feed science, government policies in the field of animal feed, theoretical/concept foundations, current issues in the field of animal feed, strategies, implementable animal feed technology and global livestock development</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Students are able to understand and study animal feed science: variety of feed ingredients, technology to increase the nutritional value of animal feed. 2. Students are able to study, analyze and evaluate animal feed ingredients with various evaluation techniques 3. Students are able to interpret and apply the results of the evaluation of feed for utilization in rations 4. Students are able to analyze current issues in the field of animal feed, apply them in the community and are able to produce policies in the field of animal feed. 5. Students are able to study, evaluate and utilize secondary metabolites to increase livestock productivity 6. Students are able to study and apply integrated farming systems to increase forage productivity and increase livestock productivity. 7. Students are able to choose the method of planting and livestock systems according to regional conditions
5	PES 94001	<p>Animal Husbandry Socio-Economic Studies (3 X 0 credits)</p> <p>Description This course discusses the socio-economic concept of livestock and its development includes the implementation of industrial technology 4.0 which can assist in the decision-making process to optimize the production and performance of the livestock industry through the interaction between cost-effective and environmentally friendly practices so as to support the success of the livestock industry business.</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Mastering the basic concepts of Livestock Socio-Economic Studies based on Industry 4.0 technology 2. Can implement strategies in optimizing implementation Industry 4.0 technology in the socio-economic field of livestock, and understand the mechanism of component interaction to improve Precision Livestock Farming (PLF). 3. Skilled in communicating scientific work related to the socio-economic study of livestock based on industry 4.0.
6	PET 94001	<p>Animal Products Technology Study (3 X 0 credits)</p> <p>Description This course discusses the basic concepts of livestock product technology and its development includes the implementation of hurdle technology as the principle of preserving livestock products. The product development mechanism includes the basic concept of the occurrence of basic phenomena of interaction of livestock product components so that an optimal product is produced, both product and process. The interaction of bioactive components derived from food additives so as to support the functional success of the product.</p> <p>CLO</p>

		<ol style="list-style-type: none"> 1. Mastering the basic concepts of livestock product technology studies Processing and product design 2. Can apply strategies in optimizing processing processes, and understand the mechanism of component interaction to increase product added value. 3. Skilled in communicating scientific work related to the study of livestock product technology
7	PEP 91002	<p>Production of Non-Ruminant and Miscellaneous Animal Strategy (2 X 0 credits)</p> <p>Description Subject Strategy to Increase Non-Ruminant and Various Livestock Production discuss about logic of science, government policy theory/concept, strategy to increase production of non-ruminant livestock and various livestock through improved management, implementation of biotechnology and breeding design to produce superior production. discussion and the emergence of ideas or innovations using basic knowledge of concepts, scientific theories are needed as a basis in formulating strategies for increasing production as outlined in scientific writings and presented</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Able to formulate problems, formulate hypotheses, and research methods for nonrum livestock production and various livestock. 2. Able to conduct written studies on policies on non-ruminant and various livestock production systems in national development aimed at fulfilling food sufficiency of animal origin. 3. Students are able to collect, process data and interpret results logically and systematically written in scientific language
8	PEP 91003	<p>Ruminant Production Strategy (2 X 0 credits)</p> <p>Description Subject Strategy to Increase Ruminant Livestock Production discuss about logic of science, government policy theories/concepts, strategies to increase ruminant livestock production through improved management, implementation of biotechnology and breeding design to produce superior production. Discussion and the emergence of ideas or innovations using basic knowledge of concepts, scientific theories are needed as a basis in formulating production improvement strategies as outlined in scientific writings and presented.</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Develop hypotheses, and research methods for ruminant livestock production 2. Able to conduct a written study of the policy of the ruminant livestock production system in national development which aims to fulfill the adequacy of food of animal origin 3. Students are able to collect, process data and interpret the results logically and systematically written in scientific language 4. Able to formulate problems,
9	PER 9202	<p>Animal Reproductive Biology (2 X 0 credits)</p> <p>Description This course discusses the basic concepts of reproductive processes including puberty, marriage, pregnancy, birth and post-birth cellular and molecular in livestock</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Mastering the basic concepts of livestock reproductive biology studies. 2. Able to apply strategies in optimizing the livestock reproduction process 3. Skilled in communicating scientific work.
10	PER	Animal Genetic Quality Improvement Strategy (2 X 0 credits)

	92003	<p>Description</p> <p>This course discusses the logic of quantitative and molecular genetics, quality improvement strategies livestock genetics through quantitative genetic models, genomics, crossbreeding programs and biotechnology. Discussions and the emergence of ideas or innovations using basic knowledge of concepts, scientific theories are needed as a basis for formulating genetic quality improvement strategies that support national development goals.</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Able to formulate problems and develop research hypotheses. 2. Able to formulate strategies for improving the genetic quality of livestock through quantitative genetic models, genomics, crossbreeding programs and biotechnology. 3. Students are able to collect, process data and interpret the results logically and systematically
11	PEM 93002	<p><i>Small Project Non Ruminants (2 X 0 credits)</i></p> <p>Description</p> <p>This course is presented for students who carry out the Doctoral program by research in the form of short research with the aim of improving their ability to do the following things: [1] reviewing scientific articles according to the specified topic, [2] laboratory analysis that supports research his dissertation, [3] compiling the results of the review into a research proposal, and [4] analyzing data and compiling reports. This course will be carried out for 1 semester with the caregiver lecturers being prospective promoters and co-promoters</p> <p>CLO</p> <p>After taking this course, students are expected to:</p> <ol style="list-style-type: none"> 1. Able to review research results that have been published in accredited media on issues related to the chosen topic 2. Able to perform laboratory analysis, especially related to parameter measurement plan in dissertation research <p>Able to present and analyze data in accordance with scientific principles Able to compile reports on research results</p>
12	PEM 93003	<p><i>Small Project Ruminants and Forages (2 X 0 credits)</i></p> <p>Description</p> <p>This course aims to provide a collaborative learning experience between professions in the field of non-ruminant livestock nutrition research. Students will be equipped with knowledge and skills through interactive lectures, small group discussions and small projects which will be supervised and guided by supervisors in terms of knowledge, science and philosophy and ethics in research, formulating problems, making hypotheses, making research designs in accordance with the methods used. selected, collect and process data from measurement results and prepare research proposals</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Able to mix research ideas with inter, multi, or transdisciplinary approaches into research designs in the form of TOR and research proposals and initiate a small project. 2. Able to develop research data collection methodology with independent, quality, and measurable performance <p>Able to learn about collaboration, team communication, professional roles and responsibilities, conflict management, and team management</p>
13	PES 94002	<p><i>Analysis and Synthesis of Livestock Agribusiness Development (2 X 0 credits)</i></p>
		<p>The Livestock Agribusiness Development course emphasizes progress and changes in rural and urban areas in developing countries, as well as their implications for the pattern of development of livestock agribusiness activities. The discussion of the</p>

		lecture material includes various factors driving progress and change, how to define progress and change, as well as what kind of policy interventions can be done to realize the main goals of livestock agribusiness development to improve added value, competitiveness and eliminate poverty. The Court also examines the importance of the role of livestock agribusiness for economic development in developing countries. In addition, it also examines concepts, theories and strategies for developing livestock agribusiness. This includes the role of the business funding sector, facilities and infrastructure, business institutions,
		<p>CLO</p> <ol style="list-style-type: none"> 1. Able to recognize and explain key concepts, ideas and debates in the development of livestock agribusiness, as well as describe the main opportunities and constraints related to the development of livestock agribusiness, which include aspects of added value, competitiveness and poverty reduction. Able to critically evaluate the contribution of various sectors of activity, types of policies, types of services, as well as the characteristics of actors in the livestock agribusiness development process. Able to understand the outlines and discussions of current debates related to the role of markets, the state, institutions, property rights, intellectual property rights, the livestock sector and the non-livestock economy 2. Able to critically evaluate past and existing efforts, as well as the potential to improve added value, competitiveness and reduce poverty). Able to analyze alternative policy options in terms of their potential impact on efforts to improve added value, competitiveness and reduce poverty.
14	PES 94003	<p>Digital-Based Livestock Agribusiness (IoT-Livestock Agribusiness = IoT-LA) (2 X 0 credits)</p> <p>Description The Digital-Based Livestock Agribusiness (IoT-Livestock Agribusiness = IoTLA) course is intended for students with an interest in teaching (lecturer) backgrounds, instructors, researchers, administrators of public and government service institutions, activists of international organizations, NGOs, and agribusiness-processors. livestock and agriculture. Therefore, students are offered increased scientific insight and cutting-edge skills regarding the relevance between agribusiness and livestock food-processors, communities, digital communication technology (IoT) management, rural development and social sciences. By paying attention to four main components, namely: (1) rural communities, (2) production and distribution of livestock commodity goods, (3) sustainability of social institutions and organizations, and (4) sustainability of rural ecosystems, this course aims to build and develop the perception of how livestock can contribute to rural development and poverty alleviation which focuses on the dynamic interaction between livelihoods in rural areas and livestock and agriculture which is understood as an integral part of the global livestock agribusiness system. Therefore, this IoTLA course also accommodates an interdisciplinary perspective on the relationship between global, regional, national and local level processes that shape livestock agribusiness, agriculture and rural development by integrating social science, economics and knowledge related to rural natural resources. The didactic method used eclectically is a combination of delivering theoretical knowledge with empirical insights and case study presentations</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Students are able to develop a system of approaches, methods, instruments for scenario studies and animal Sciences agribusiness policies. 2. Designing IoT (virtual coworking-space, application) for livestock agribusiness

		development and education.
15	PET 95002	Animal Products Technology Development (2 X 0 credits)
		<p>Description</p> <p>This course discusses the basic concepts of livestock product technology development and its development includes the implementation of livestock product handling technology to maintain the freshness of livestock products. The product development mechanism includes the basic concept of the occurrence of the basic phenomena of factors that cause product damage so that a product that remains fresh is produced. Products and processes have records and adhere to the process, so they are able to track the stages that cause damage to fresh products. Understand the rules related to products, standardization and distribution and storage.</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Can design the concept of traceability to the processing flow to the consumer 2. Able to implement and harmonize product safety supporting regulations 3. Having skills in designing documentation of quality assurance of livestock products
16	PET 95003	Animal Products Bioprocess Technology (2 X 0 credits)
		<p>Description</p> <p>Discussing the philosophy, logic of science about bioprocesses in the field of animal products technology including microbial technology and changes in the components of livestock products to produce livestock products that act as healthy and healthy functional products, preservation of microbes that are useful as probiotics.</p> <p>CLO</p> <ol style="list-style-type: none"> 1. Mastering the basic concepts of livestock product bioprocess technology studies. 2. Able to optimize the use of microbial technology and fermentation of processed livestock products. 3. Can develop analytical methods for bioprocess results

CURRICULUM IMPLEMENTATION STRATEGY

The curriculum implementation strategy is a step to ensure that the curriculum can be implemented in accordance with the planning and lead students to achieve the learning outcomes that have been formulated, there are four implementation strategies, namely

1. Focus on learning achievement that has been formulated
2. Ensuring the fulfillment of learning rights for 6-14 semesters, students get learning experiences with additional competencies that are related to the ILOs study program for the DPAS
3. Students get a real-world learning experience according to their profile or scope of work.

4. The curriculum designed and implemented is flexible and able to adapt to the development of science and technology (scientific vision) and the demands of the field of work (market signals).

LEARNING PROCESS

1. Online Learning to Facilitate the Learning Process in a Pandemic

The DPAS learning program allows students to carry out distance learning activities in accordance with the Independent Learning Guidebook-Independent Campus, this guide can be used as a normative guide and reference to carry out the learning process in DPAS. Teaching and learning activities as listed in the Semester Learning Plan (SLP).

2. Process of Academic and Guidance Services

During the education process, students have the right to fulfill academic services and remote guidance both by academic staff, course supervisors and supervisors in this case promoters and co-promoters.

3. Learning Assessment

Learning Assessment is described completely in other document Assessment of Learning Outcome.



KEMENTERIAN PENDIDIKAN, KEBUDAYAAN,
RISET, DAN TEKNOLOGI
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SURAT TUGAS

Nomor: 1191 /UN10.F05/KP/2021

Perbaikan I

Dekan Fakultas Peternakan Universitas Brawijaya menugaskan nama-nama dibawah ini sebagai TIM Rekonstruksi Kurikulum Program Doktor Ilmu Ternak Fakultas Peternakan Universitas Brawijaya pada bulan Juni 2021 sampai dengan Agustus 2021, dengan susunan sebagai berikut:

- Pengarah : Prof.Dr.Sc.Agr.Ir. Suyadi, MS, IPU., ASEAN Eng.
 Penanggungjawab : 1. Prof. Dr. Ir. M. Halim Natsir, S.Pt.,MP.,IPM., ASEAN Eng.
 2. Prof.Dr.Ir. Budi Hartono, MS., IPU., ASEAN Eng
 3. Dr. Agus Susilo, S.Pt., MP., IPM., ASEAN Eng
 Ketua : Prof.Dr.Ir. Lilik Eka Radiati, MS., IPU
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 2. Prof.Dr.Ir. Trinil Susilawati, MS., IPU., ASEAN Eng
 3. Prof.Dr.Ir. VM Ani Nurgartiningasih, M.Sc.
 4. Prof.Dr.Ir. Siti Chuzaemi, MS., IPU., ASEAN Eng
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 9. Dr. Ir. Marjuki, M.Sc
 10. Dr.Ir. Imam Thohari, MP., IPM.,ASEAN Eng
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 12. Rini Dwi Wahyuni, S.Pt., M.Sc..
 13. Rizki Prafitri, S.Pt., M.A., Ph.D.
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No	Keterangan	Paraf
1	Remun - Non Tunai	
2	Non Remun - Non Tunai	