UNIVERSITY OF AGRICULTURE IN KRAKOW

FACULTY OF ANIMAL SCIENCES

LEARNING OUTCOMES

Field: Animal Science
Level of study: the second degree (Master course)
Speciality: *Bioengineering in Animal Science*

Field: ***Animal Science***
Mode of study: ***state studies***
Level of education: ***2nd cycle***

Kraków 2017

I. General characteristics of the studies

1. Unit of the University leading the field of study: ***Faculty of Animal Sciences***
2. Date and number of Faculty Council Resolution and the Resolution of Senate of the University of Agriculture in Krakow concerning creation of the course:
   a) Learning outcomes:
      - the last evaluation and correction of learning outcomes: *Resolution of the Council of the Faculty of Animal Sciences* ***no. 16/2017/2018 of November 22, 2017;*** *approved by the Resolution of the University Senate of December 21st 2017,*

   b) Education programme:
      - Resolution of the Council of the Faculty of Animal Sciences no. ***80/2012/2013 of June 26, 2013*** *(amendments: no. 21/2013/2014 of January 22, 2014, no. 91/2013/2014 of June 18, 2014r,* ***no. 89/2016/2017 of June 28, 2017****)*
3. Field of study: ***Animal Science***
4. Name of speciality: ***Bioengineering in Animal Science***
5. Level of education: ***the 2nd cycle***
6. Profile of education: ***general-academic***
7. Mode of study: ***state study***
8. Name of qualification and title conferred by the graduate: ***magister inżynier (MSc.)***
9. Assignment to an area or areas of learning: ***Agriculture, Forestry and Veterinary***
10. Identification of areas of science and scientific disciplines the learning results from: ***Agricultural sciences – Animal Husbandry***
11. Classification of ISCED: ***0811***
12. Number of ECTS points necessary to obtain qualifications corresponding to the level of education: ***90***
13. Total number of ECTS points that a student must obtain in the course of classes requiring direct participation of academic teachers and students*: **46***
14. Total number of ECTS points that a student must obtain as part of classes in the humanities or social sciences: **5**.
15. The dimension of internship and the number of credits: **4 weeks, 2** ECTS

II. Description of the assumed learning outcomes

1. Table referring field effects of education to area effects

LEARNING OUTCOMES
P7 – the 7th level of the Polish Qualifications Framework
S – typical characteristics of qualifications obtained in higher education
W – knowledge category
G – depth and range
K – context
U – skills category
W – the use of knowledge (problems to be solved and tasks performed)
K – communicating (receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language)
O – work organization (planning and teamwork)
U – learning (planning your own development)

K – social competences category

K – critical assessment
O – responsibility
R – professional role

ZOO – results of education in the field of Animal Science
2 – 2nd degree (cycle) studies
01, 02, 03, and successive – numbers of education results

Field of study:	**Animal Science (Animal Husbandry)**
Level of study:	2nd
Profile of education:	General-academic
Symbol of the Polish Qualifications Framework:	P7S
Area of education in the field of:	agricultural, forestry and veterinary sciences
Field of science or art / discipline:	Agricultural sciences/animal husbandry

Symbol of the effect of education for the field of study	Description of the learning effect	Symbol of the educational effect for the area of education*
		R
KNOWLEDGE - the graduate knows and understands		
ZOO2_W01	basic types and types of experiments, principles, methods and techniques for conducting research work; basic theories in the field of scientific disciplines relevant to the studied field	R/P7S_WG/1 R/P7S_WG/4 R/P7S_WK
ZOO2_W02	methods of mathematical statistics, with particular reference to methods used in animal science experiments; methods of statistical description of the sample, assessment of random variable distribution, estimation of population parameters, verification of hypotheses, analysis of variance, regression and correlation	R/P7S_WG/1
ZOO2_W03	methods of genetic engineering and molecular diagnostics and methods of their application in animal breeding; the basic concepts of conservation of genetic resources	R/P7S_WG/1 R/P7S_WG/2 R/P7S_WG/4 R/P7S_WK
ZOO2_W04	in a deep degree knowledge about bioengineering of animals and the impact of xenobiotics and environmental factors on animal reproduction and development; the scope of research methods used in the diagnosis of the reproductive system	R/P7S_WG/1 R/P7S_WG/2 R/P7S_WG/3 R/P7S_WG/4 R/P7S_WK
ZOO2_W05	knows to an advanced extent the range of analytical techniques and methods used in animal sciences, allowing for the interpretation of the results of conducted research	R/P7S_WG/1 R/P7S_WG/2 R/P7S_WG/4
ZOO2_W06	the rules of planning and organization of breeding work in various directions of use, methods and programs for animal improvement and economic efficiency of breeding work	R/P7S_WG/2 R/P7S_WG/3 R/P7S_WG/4 R/P7S_WK
ZOO2_W07	animal husbandry systems conducive to maintaining their welfare and has knowledge about the impact of environmental factors on the body; knows the causes and ways of spreading diseases	R/P7S_WG/1 R/P7S_WG/2 R/P7S_WG/4 R/P7S_WK
ZOO2_W08	the issues of digestion, metabolism and absorption of nutrients and energy conversion in animals, as well as the principles of nutrition and the consequences of improper animal nutrition	R/P7S_WG/1 R/P7S_WG/2 R/P7S_WG/4 R/P7S_WK
ZOO2_W09	the principles of safe production of feed and animal products; issues in	R/P7S_WG1

	the field of modern technologies, preparation, processing and methods of preservation of animal feed; has knowledge about obtaining health-oriented quality of animal products	R/P7S_WG2 R/P7S_WG4
ZOO2_W10	in a deepened degree the principles of maintaining facilities, technical systems and technologies typical for agricultural areas, specialized methods, systems and technologies used in the broadly understood breeding, animal husbandry and use, including those favouring the shaping and protection of the landscape and the natural environment; rules for the functioning of agri-environmental programs	R/P7S_WG/1 R/P7S_WG/2 R/P7S_WG/3 R/P7S_WG/4 R/P7S_WK
ZOO2_W11	to an advanced extent theoretical aspects regarding methods of animal breeding and growing; stock management; numerical methods for monitoring the herd and supporting decision-making processes in the use of animals	R/P7S_WG/1 R/P7S_WG/2 R/P7S_WG/3 R/P7S_WG/4 R/P7S_WK
ZOO2_W12	concepts and principles in the field of protection of industrial property and copyright as well as the need to manage intellectual property resources, uses patent information resources	R/P7S_WK
ZOO2_W13	general principles of creating and developing forms of individual entrepreneurship, using knowledge in the fields of science and scientific disciplines, relevant to the studied field	R/P7S_WG/3 R/P7S_WK
SKILLS - the graduate can:		
ZOO2_U01	design and perform the experiment, evaluate statistically the obtained results and interpret them, using IT tools and literature resources	R/P7S_UW/1 R/P7S_UW/2 R/P7S_UW/3 R/P7S_UU
ZOO2_U02	apply methods of breeding biotechnology, use molecular genetics techniques to perform research tasks, and apply genetic engineering techniques to identify the carrier of genes that determine genetic diseases and animal traits	R/P7S_UW/1 R/P7S_UW/2
ZOO2_U03	choose animal improvement strategies using genetic information in the assessment of breeding value and selection; assess the effectiveness of breeding work; use monitoring techniques, numerical methods and specialist IT tools in stock management	R/P7S_UW/1 R/P7S_UW/2 R/P7S_UW/3
ZOO2_U04	evaluate and choose ways to manage animal populations; plan the production and make the selection of the optimal stock reproduction system, taking into account current economic conditions; interpret the results of the reproductive performance assessment of herds	R/P7S_UW/2 R/P7S_UW/3 R/P7S_UK R/P7S_UO R/P7S_UU
ZOO2_U05	analyse and evaluate the principles of animal maintenance and use; organize animal husbandry in accordance with the principles of well-being and environmental protection; take standard actions to prevent epizootic hazards in the environment; is able to critically analyse the assumptions and condition of the fisheries economy, and then independently formulate conclusions and recommendations regarding its rationalization; can describe the rules for the functioning of agri-environmental programs	R/P7S_UW/1 R/P7S_UW/2 R/P7S_UW/3 R/P7S_UU R/P7S_UO
ZOO2_U06	select and apply methods of preservation of raw materials of animal origin and processed food and choose the technology of food processing, storage, confectioning and marking of products	R/P7S_UW/3
ZOO2_U07	to retrieve, secure, store and analyze biological and genetic material and interpret information from various sources concerning the protection of biodiversity	R/P7S_UW/2 R/P7S_UW/3 R/P7S_UK R/P7S_UO
ZOO2_U08	use analytical methods and modern scientific-research apparatus	R/P7S_UW/1 R/P7S_UW/2
ZOO2_U09	assess physiological and pathological parameters in animals as well as threats resulting from exposure of animals to environmental factors and formulate the manner and procedure of dealing with animals during experiments	R/P7S_UW/1 R/P7S_UW/2 R/P7S_UW/3
ZOO2_U10	manage the herd of animals in the field of reproduction, using the	R/P7S_UW/1

	acquired knowledge; assess and prepare animals for reproduction as well as obtain and identify gametes and embryos, and manipulate them, diagnose pregnancy in animals; results of egg incubation and embryopathology analysis in birds	R/P7S_UW/2 R/P7S_UW/3 R/P7S_UO
ZOO2_U11	cooperate with animal breeders; provide expert advice in the field of animal nutrition and feed production and propose and justify the selection of necessary analytical techniques and systems to assess the quality and nutritional value of feed for various livestock species	R/P7S_UK R/P7S_UU
ZOO2_U12	feed animals in various physiological and pathological states; use computer techniques to balance fodder mixtures and food doses, design feed strips and develop feeding programs in various farm objects	R/P7S_UW/1 R/P7S_UW/2 R/P7S_UW/3 R/P7S_UO
ZOO2_U13	select appropriate techniques, methods, technologies, materials and tools to solve a specific problem related to animal growing and breeding; make a critical analysis of technological methods and solutions applied in water management and flood protection in terms of their impact on the biodiversity of water ecosystems, their use and human safety	R/P7S_UW/3
ZOO2_U14	define, analyse and solve current problems in the arena of the studied field of study and specialization, taking into account environmental and economic conditions	R/P7S_UW/3
ZOO2_U15	precise communication with various entities in verbal, written and graphic form, use the understanding from the scientific literature; prepare a scientific study in Polish and foreign language; independently expands his knowledge in the field of animal sciences	R/P7S_UK R/P7S_UU
ZOO2_U16	assess the advantages and disadvantages of the activities undertaken, including their originality in solving existing professional problems - to gain experience and improve engineering competences	R/P7S_UW/3 R/P7S_UU
ZOO2_U17	carry out research tasks under the supervision of a tutor regarding the studied field, correctly interpret the results obtained and draw conclusions	R/P7S_UW/1 R/P7S_UW/2
ZOO2_U18	use a foreign language in the fields of science and scientific disciplines relevant to the studied field of study, in accordance with the requirements set for the B2 + level of the European System of Description of Language Education; can read and understand scientific literature fluently, and prepare and present in the Polish and foreign languages presentations in the field of animal sciences	R/P7S_UK
SOCIAL COMPETENCES - the graduate is ready to:		
ZOO2_K01	earning and continuous education throughout life, can organize the learning process of other people	R/P7S_KK
ZOO2_K02	systematically work on projects whose implementation is long-term and is aware of the responsibility for the effects of the team's work, assuming different roles in it	R/P7S_KR R/P7S_KO
ZOO2_K03	make decisions independently, organize teamwork, perform managerial functions, and set up and run his own business	R/P7S_KR R/P7S_KO
ZOO2_K04	undertake activities aimed at reducing the risk and predicting the effects of human activities in the area of animal sciences and the environment of living animals	R/P7S_KO R/P7S_KK
ZOO2_K05	solve complex decision problems related to the use of animals and is aware of the need to make a critical evaluation of the results of the use of various methods and decision support techniques in the management of the herd	R/P7S_KR R/P7S_KK
ZOO2_K06	care for the welfare of animals and for shaping and condition of the natural environment	R/P7S_KO
ZOO2_K07	think and act in an entrepreneurial manner on issues that aim to apply animal science knowledge in his professional work.	R/P7S_KR
ZOO2_K08	act in accordance with the principles of ethics in professional and social work	R/P7S_KO R/P7S_KR
ZOO2_K09	be aware of the responsibility for the transmitted professional content as part of advisory and dissemination activities.	R/P7S_KO R/P7S_KR

2. Table of area effects of education covering by field effects of education

AREA EFFECTS

(on the basis of the Regulation of the Ministry of Science and Higher Education of September 26, 2016, Journal of Laws, item 1543)

Table covering the effects of education in the field of agricultural, forestry and veterinary sciences by the field effects of education

Area effect	Table of **AGRICULTURAL, FORESTRY AND VETERINARY area** effect reference to the effects of **THE ANIMAL SCIENCE** field of study	Reference to field of stydy learning outcomes
KNOWLEDGE - the graduate knows and understands		
R/P7S_WG/1	to a deeper extent the research methodology and basic theories in the field of scientific disciplines relevant to the field of study	ZOO2_W01, ZOO2_W02, ZOO2_W03, ZOO2_W04, ZOO2_W05, ZOO2_W07, ZOO2_W08, ZOO2_W09, ZOO2_W10, ZOO2_W11
R/P7S_WG/2	to a deeper extent the role and importance of the natural environment and the sustainable use of biological diversity and its threat	ZOO2_W03, ZOO2_W04, ZOO2_W05, ZOO2_W06, ZOO2_W07, ZOO2_W08, ZOO2_W09, ZOO2_W10, ZOO2_W11
R/P7S_WG/3	to a deeper extent the state and comprehensive operation of factors determining the functioning and development of rural areas	ZOO2_W04, ZOO2_W06, ZOO2_W10, ZOO2_W11, ZOO2_W13
R/P7S_WG/4	to a deeper extent, the principles of maintaining facilities, facilities, technical systems and technologies typical of agricultural, forestry and agro-food processing areas within the scope of a given field of study	ZOO2_W01, ZOO2_W03, ZOO2_W04, ZOO2_W05, ZOO2_W06, ZOO2_W07, ZOO2_W08, ZOO2_W09, ZOO2_W10, ZOO2_W11
R/P7S_WK	ethical and legal conditions related to scientific, didactic and implementation activities	ZOO2_W01, ZOO2_W03, ZOO2_W04, ZOO2_W05, ZOO2_W06, ZOO2_W07, ZOO2_W08, ZOO2_W10, ZOO2_W11, ZOO2_W12, ZOO2_W12, ZOO2_W13,
SKILLS - the graduate can:		
R/P7S_UW/1	use advanced techniques and research tools in the field of scientific disciplines relevant to the field of study	ZOO2_U01, ZOO2_U02, ZOO2_U03, ZOO2_U05, ZOO2_U08, ZOO2_U09, ZOO2_U10, ZOO2_U12, ZOO2_U17
R/P7S_UW/2	independently plan and carry out experiments and measurements, interpret the results obtained and draw conclusions	ZOO2_U01, ZOO2_U02, ZOO2_U03, ZOO2_U04, ZOO2_U05, ZOO2_U07, ZOO2_U08, ZOO2_U09, ZOO2_U10, ZOO2_U17
R/P7S_UW/3	carry out an independent, comprehensive analysis of phenomena affecting production, food quality, animal and human health, the state of the natural environment and natural resources, and select and modify activities (including techniques and technologies) consistent with the field of study, adapted to natural resources, to improve quality of human life	ZOO2_U01, ZOO2_U03, ZOO2_U04, ZOO2_U05, ZOO2_U06, ZOO2_U07, ZOO2_U09, ZOO2_U10, ZOO2_U12, ZOO2_U13, ZOO2_U14, ZOO2_U16
R/P7S_UK	communicate on specialist topics with diverse groups of recipients, hold a debate, use a foreign language at the B2 + level of the European System of the Description of Language Education and to a greater extent in the area of specialist terminology	ZOO2_U04, ZOO2_U07, ZOO2_U11, ZOO2_U15, ZOO2_U18
R/P7S_UO	manage the team's work	ZOO2_U04, ZOO2_U05, ZOO2_U07, ZOO2_U10, ZOO2_U12,
R/P7S_UU	plan and implement their own lifelong learning and guide others in this area	ZOO2_U01, ZOO2_U04, ZOO2_U05, ZOO2_U11, ZOO2_U15, ZOO2_U16,
SOCIAL COMPETENCES - the graduate is ready to:		
R/P7S_KK	critically evaluate the received content; recognition of the importance of knowledge in solving cognitive and practical problems	ZOO2_K01, ZOO2_K04, ZOO2_K05
R/P7S_KO	to fulfil social obligations; inspiring and organizing activities for the social environment, initiating activities for the public interest; thinking and acting in an entrepreneurial way	ZOO2_K02, ZOO2_K03, ZOO2_K04, ZOO2_K06, ZOO2_K08, ZOO2_K09
R/P7S_KR	The graduate is ready to responsibly perform professional roles taking into account changing social needs, including: - developing the profession, - maintaining the ethos of the profession	ZOO2_K02, ZOO2_K03, ZOO2_K05, ZOO2_K07,ZOO2_K08, ZOO2_K09,

	- adherence to and development of professional ethics and actions to comply with these principles	

3. Table covering engineering effects by field of study learning outcomes

ENGINEERING COMPETENCES

(on the basis of the Regulation of the Ministry of Science and Higher Education of September 26, 2016, Journal of Laws, item 1543)

Table covering the competence of the engineer through directional learning outcomes

Symbol	**KNOWLEDGE - the graduate knows and understands**	**Symbol of the learning effect for the field of study**
KNOWLEDGE - the graduate knows and understands:		
P7S_WG	basic processes occurring in the device life cycle; objects and technical systems	ZOO2_W01, ZOO2_W03, ZOO2_W04, ZOO2_W05, ZOO2_W06, ZOO2_W07, ZOO2_W08, ZOO2_W10, ZOO2_W11
P7S_WK	general principles of creating and developing forms of individual entrepreneurship	ZOO2_W04, ZOO2_W06, ZOO2_W07, ZOO2_W08, ZOO2_W11, ZOO2_W13,
SKILLS - the graduate can:		
P7S_UW/1	plan and conduct experiments; including computer measurements and simulations; interpret the results obtained and draw conclusions	ZOO2_U01, ZOO2_U02, ZOO2_U03, ZOO2_U04, ZOO2_U07, ZOO2_U08, ZOO2_U09, ZOO2_U10, ZOO2_U12, ZOO2_U17
P7S_UW/2	in identifying and formulating engineering task specifications and solving them: - use analytical methods; simulation and experimental; - recognize their systemic and non-technical aspects; - make an initial economic assessment of the proposed solutions and engineering activities	ZOO2_U01, ZOO2_U02, ZOO2_U03, ZOO2_U04, ZOO2_U05, ZOO2_U06, ZOO2_U07, ZOO2_U08, ZOO2_U09, ZOO2_U10, ZOO2_U11, ZOO2_U12, ZOO2_U13, ZOO2_U14, ZOO2_U16, ZOO2_U17
P7S_UW/3	make a critical analysis of the functioning of existing technical solutions and evaluate these solutions	ZOO2_U01, ZOO2_U02, ZOO2_U03, ZOO2_U04, ZOO2_U05, ZOO2_U06, ZOO2_U07, ZOO2_U08, ZOO2_U09, ZOO2_U10, ZOO2_U11, ZOO2_U12, ZOO2_U13, ZOO2_U14, ZOO2_U16, ZOO2_U17
P7S_UW/4	design - in accordance with the given specification - and perform a typical for the field of study device; object; system or perform process; using properly selected methods; technics; tools and materials	ZOO2_U01, ZOO2_U03, ZOO2_U04, ZOO2_U05, ZOO2_U06, ZOO2_U07, ZOO2_U08, ZOO2_U09, ZOO2_U10, ZOO2_U11, ZOO2_U12, ZOO2_U13, ZOO2_U14, ZOO2_U16, ZOO2_U17