Zarządzenie nr 120

Rektora Zachodniopomorskiego Uniwersytetu Technologicznego w Szczecinie

z dnia 30 października 2023 r.

w sprawie opisów efektów uczenia się w tłumaczeniu na język angielski dla kierunków studiów prowadzonych na Wydziale Biotechnologii i Hodowli Zwierząt

Na podstawie art. 23 ustawy z dnia 20 lipca 2018 r. Prawo o szkolnictwie wyższym i nauce (tekst jedn. Dz. U. z 2023 r. poz. 742, z późn. zm.) w związku z § 3 ust. 7 zarządzenia nr 64 Rektora ZUT z dnia 1 października 2019 r. w sprawie zasad sporządzania i wydawania dyplomów ukończenia studiów i suplementów do dyplomu (z późn. zm.) zarządza się, co następuje:

§ 1.

1. W celu wydania na wniosek absolwenta odpisu suplementu do dyplomu w tłumaczeniu na język angielski wprowadza się – uchwalone przez Senat – opisy efektów uczenia się w tłumaczeniu na język angielski dla kierunków studiów prowadzonych na Wydziale Biotechnologii i Hodowli Zwierząt.
2. Opis efektów uczenia się w tłumaczeniu na język angielski dla poszczególnych kierunków studiów stanowi integralną cześć odpisu suplementu do dyplomu.

§ 2.

Opisy efektów w tłumaczeniu na język angielski w wydawanych odpisach suplementów do dyplomu dla kierunków studiów rozpoczynających się:

1) od roku akademickiego 2019/2020:
   a) biotechnologia, studia pierwszego stopnia – stanowi załącznik nr 1,
   b) biotechnologia, studia drugiego stopnia – stanowi załącznik nr 2,
   c) kynologia studia pierwszego stopnia – stanowi załącznik nr 3,
   d) kynologia, studia drugiego stopnia – stanowi załącznik nr 4,
   e) zootechnika, studia pierwszego stopnia – stanowi załącznik nr 5,
   f) zootechnika, studia drugiego stopnia – stanowi załącznik nr 6;
2) od roku akademickiego 2021/2022 – biotechnologia, studia drugiego stopnia – stanowi załącznik nr 7.

§ 3.

W zarządzeniu nr 94 Rektora ZUT z dnia 6 listopada 2019 r. w sprawie opisu efektów uczenia się w tłumaczeniu na język angielski dla poszczególnych kierunków studiów prowadzonych w ZUT (z późn. zm.) uchyla się w § 1 pkt 1 oraz załącznik nr 1 – Kierunki Wydziału Biotechnologii i Hodowli Zwierząt.

§ 4.

Zarządzenie wchodzi w życie z dniem podpisania.

W zastępstwie Rektora

prof. dr hab. inż. Jacek Przepiórski
prorektor ds. nauki

Załącznik nr 1

do zarządzenia nr 120 Rektora ZUT z dnia 30 października 2023 r.

Biotechnologia, studia pierwszego stopnia (na podstawie uchwały nr 58 Senatu ZUT z dnia 26 czerwca 2017 r.)

Programme of studies: *biotechnology*

Level of qualification: first cycle studies

Educational profile: general academic

Fields of science: Agricultural sciences, Natural sciences, Engineering and technology

Discipline of science: animal science and fisheries (80%), biological sciences (15%), materials engineering (5%)

Name of qualification (Title conferred): inżynier

Description of the planned educational effects

Code	Learning outcomes for programme of studies
Knowledge	
BT_1A_W01	has general knowledge of mathematics, physics and related sciences adapted to programme of studies “biotechnology”
BT_1A_W02	has systematic, based on theory, knowledge of chemistry (organic, inorganic, physical and analytical) and biology and living organisms
BT_1A_W03	has elementary knowledge of law, management and economics
BT_1A_W04	knows basic principles of safety and hygiene of work and intellectual property protection
BT_1A_W05	shows knowledge of a foreign language at B2 level and of basic vocabulary in biotechnology in a foreign language
BT_1A_W06	has general knowledge of humanities and its significance in agricultural sciences; knows and understands basic ethical and legal conditions relating to scientific, teaching and development activities
BT_1A_W07	has general knowledge of structure of living organisms and knows biochemical, molecular and cellular fundamentals of organisms functioning
BT_1A_W08	has systematic knowledge of analysis of molecular, enzymatic and physiological processes of living organisms
BT_1A_W09	has established knowledge of structure, function and computer analysis of genes and genomes, methods of inheriting, as well as the influence of genetic factors on forming environment
BT_1A_W10	has in-depth knowledge relating to using basic laboratory methods, techniques and engineering tools allowing to complete technical tasks adopted to programme of studies “biotechnology”
BT_1A_W11	has basic knowledge of selecting reactors, devices, technological lines and computer programmes used in biotechnology
BT_1A_W12	shows general knowledge connected to using biotechnological processes and methods in various branches of science and industry
BT_1A_W13	knows research techniques and principles of preparing and writing a scientific study
BT_1A_W14	knows and understands the role and significance of natural environment and sustainable use of biodiversity and its threats
BT_1A_W15	has general knowledge of the influence of biotechnological factors on functioning and development of animal and plant production
BT_1A_W16	has knowledge of diversity, functioning and significance of microorganism for a human and natural environment
BT_1A_W17	shows knowledge of morphological, anatomical and cellular structure and has knowledge of diseases and developmental disorders of living organisms

Code	Learning outcomes for programme of studies
BT_1A_W18	has general knowledge of nucleic acids structures modification techniques and using living organisms in biomedical studies
BT_1A_W19	has knowledge on influence of pathogenic agents and understands principles of immunological regulation and principles of immunological diagnostics
BT_1A_W20	has knowledge of principles of rational nutrition and healthy lifestyle; understands procedures of acquiring and obtaining various food products
BT_1A_W21	has basic knowledge of computer science, computer software and biological databases used in biotechnology
Skills	
BT_1A_U01	Uses knowledge of mathematics, statistics and computer science, which he/she applies for description of phenomena occurring in nature
BT_1A_U02	Can determine chemical, physical and biochemical phenomena and processes in natural environment and used by human; can estimate risk and prevent possible hazard resulting from occurring processes and phenomena
BT_1A_U03	Uses knowledge for characterising and classification of living organisms basing on monographic sources; has practical skills of observing plants in a place of their occurrence; analyses issues relating to beginning and evolution of life on Earth
BT_1A_U04	Uses knowledge of microbiology and immunology; has a skill of keeping microorganisms' culture; has a skill of understanding mechanisms conditioning microorganisms' virulence, can characterise selected infectious diseases; understands functioning of immunological system; can use appropriate diagnostic techniques
BT_1A_U05	Uses basic issues of structure and function of animal and plant organisms' cells; can indicate research methods for indication and analysis of processes occurring in a cell; can start cells and tissues cultures
BT_1A_U06	Identifies and analyses mechanisms determining life functions, ontogenesis, heredity processes, evolutionary mechanisms of organisms and mutagenic agents
BT_1A_U07	Can discuss structure, location and function of individual tissues, organs and systems of living organisms; can appropriately interpret physiological processes occurring in plant's and animal's organism
BT_1A_U08	Selects and uses methods, techniques and devices routinely used in research and diagnostic laboratories; uses them in solving problems concerning food production, animal health protection and natural environment protection
BT_1A_U09	Has a skill of using a foreign language at B2 level of the Common European Framework of Reference
BT_1A_U10	Uses key notions of biotechnology; knows and assesses significance of biotechnology in various fields of life and in creating and obtaining existing biologically active substances; knows basic issues of pharmacology and pharmacokinetics of drugs; can design biotechnological lines and use various research devices and apparatuses in biotechnology; is aware of hazards resulting from achievements of biotechnology; knows issues connected with biosafety
BT_1A_U11	Can use basic sociological and psychological knowledge useful in a biotechnologist's work; has some knowledge of legal grounds and mechanisms of intellectual property protection; knows and can use fundamentals of economy and management; understands bioethical, social, legal and economic determinants concerning achievements of modern biotechnology
BT_1A_U13	Uses IT tools and biological databases in biotechnological research
BT_1A_U14	Can present methods of preventing contamination of the environment; knows notation of hazardous substances concentration; knows fundamentals of toxic substances influence on organisms, uses knowledge of biotechnology application in environmental protection
BT_1A_U16	Uses principles of rational nutrition and health lifestyle; understands procedures of acquiring and obtaining various food products, including those using microorganisms

Code	Learning outcomes for programme of studies
BT_1A_U17	Plans, organises and executes simple research tasks, individually and in a team, led by a tutor; interprets obtained results and draws conclusions; systematically updates hi/her knowledge and uses it in solving individual problems; has an ability to disseminate acquired knowledge in his/her professional and scientific circle; individually prepares the diploma paper
Social competences	
BT_1A_K01	understands molecular basis of biotechnological processes and is aware of their empirical cognisability basing on mathematical and statistical methods
BT_1A_K02	shows understanding of basic principles of ethics, economics and law; acts in accordance with them
BT_1A_K04	shows responsibility for safety of own and other people's work; is aware of influence of biotechnology on creation and state of the natural environment and human health
BT_1A_K05	shows openness to general and specific creation and development of own learning activities basing on various sources of scientific information; can think and act in an entrepreneurial way
BT_1A_K06	shows positive opinions and attitudes towards people, organisms and environment; has high sensitivity to their needs and problems
BT_1A_K08	is aware of biological and technological determinants of basic biotechnological processes

Załącznik nr 2

do zarządzenia nr 120 Rektora ZUT z dnia 30 października 2023 r.

Biotechnologia, studia drugiego stopnia (na podstawie uchwały nr 23 Senatu ZUT z dnia 23 kwietnia 2018 r)

Programme of studies: *biotechnology*

Level of qualification: second cycle studies

Educational profile: general academic

Fields of science: Agricultural sciences, Natural sciences, Engineering and technology

Discipline of science: animal science and fisheries (60%), nutrition and food technology (10%), agriculture and horticulture (10%) biological sciences (5%), materials engineering (10%), chemical engineering (5%)

Name of qualification (Title conferred): magister inżynier

Description of the planned educational effects

Code	Learning outcomes for programme of studies
Knowledge	
BT_2A_W01	has extended knowledge of biology, chemistry, mathematics, physics and related sciences adapted to programme of studies “biotechnology”
BT_2A_W02	has in-depth knowledge of economic, legal and humanistic aspects in biotechnology
BT_2A_W03	knows the principles of management, including quality management
BT_2A_W04	knows detailed principles of work safety in a laboratory and protection of industrial ownership in biotechnology
BT_2A_W05	knowns and understands ethical, legal and economic standards in a profession of a biotechnologist; knows ethical determinants of work with biological material
BT_2A_W06	has a detailed and systematic knowledge of using molecular, enzymatic and physiological processes of living organisms in biotechnology
BT_2A_W07	shows in-depth knowledge on the structure, function and computer analysis of genes and genomes, methods of heredity as well as the influence of genetic factors on creating environment
BT_2A_W08	has knowledge of advanced laboratory methods, techniques and engineering tools allowing to conduct technical tasks adapted to programme of studies “biotechnology”
BT_2A_W09	has extended knowledge of engineering processes, technological devices and lines used in biotechnology
BT_2A_W10	shows in-depth and systematic knowledge connected with using biotechnological processes and methods in various branches of science and industry
BT_2A_W11	knows research techniques and principles of preparing and writing a scientific paper
BT_2A_W12	shows advanced knowledge concerning the influence of human activity on natural environment and its biodiversity
BT_2A_W13	has extended general knowledge of the influence of biotechnological factors on human health and on functioning and development of animal and plant production
BT_2A_W14	has enriched knowledge of genetic modifications and their significance for human and natural environment
BT_2A_W15	shows in-depth knowledge of modern breeding significant for development of rural areas
BT_2A_W17	knows advanced bioinformatics techniques and can use them in biotechnology

Code	Learning outcomes for programme of studies
Skills	
BT_2A_U01	uses in-depth theoretical knowledge to analyse processes and phenomena influencing the improvement of life quality and health of animals and people
BT_2A_U02	can plan and analyse biotechnological research using tools of bioinformatics
BT_2A_U03	knows a foreign language at level B2+, communicates in everyday and professional situations, can write a report and simple essay on a known topic; has a skill of preparing oral presentations within the scope of biotechnological vocabulary
BT_2A_U04	analyses factors influencing food production, quality and safety; analyses factors influencing natural environment; estimates outcomes of creating, using and releasing GMO to the environment; determines the influence and significance of biotechnology w in protection of natural environment and biodiversity
BT_2A_U05	can individually or in a group design and conduct an experimental process, including measurements that can be used in biotechnology; interprets obtained results and draws conclusions; conducts a discussion based on individually acquired knowledge using a specialist language
BT_2A_U06	makes thorough analysis of molecular grounds for evolution as well as factors influencing functioning of genome and transcriptome; analyses factors influencing variations in an organism
BT_2A_U07	analyses main metabolic pathways and mechanisms of their regulation basing on the knowledge on structure and biological functions of proteins, hormones and vitamins; can acquire and use enzymes
BT_2A_U08	Selects and uses advanced research techniques and tools used in biotechnology
BT_2A_U09	uses learnt methods in research; draws up literature in accordance with research profile; analyses scientific news and other source materials in the context of own research project; can prepare a project of own scientific research and independently prepare scientific paper
BT_2A_U10	observes basic principles of good laboratory practice (GLP); can determine hazards of biotechnologist's work, can react in dangerous situations applying rules of work safety and hygiene
Social competences	
BT_2A_K01	shows need of constant expanding general and specialised knowledge, is aware of advisability of expanding learnt knowledge both in professional activities and personal development
BT_2A_K02	shows understanding of biotechnological processes used in various areas of human activities; interprets and describes those processes using scientific attitude
BT_2A_K03	is aware of influence of biotechnology on shaping and state of natural environment and human health
BT_2A_K04	is aware of existence of ethical and social standards connected with conducted research and professional activities; understands advisability of acting according to set ethical and legal principles
BT_2A_K05	shows discipline in individual work; willingly participates in group work; can creatively plan and conduct own and team activities
BT_2A_K06	shows responsibility for made decisions and their outcomes; presents argumentative and critical attitude
BT_2A_K07	understands advisability of stimulating individual cognitive activities and improving professional competences; shows independence in acquiring scientific information from various sources
BT_2A_K08	is aware of joint responsibility for safety of own and other people's work; can think and act in an entrepreneurial way

Załącznik nr 3

do zarządzenia nr 120 Rektora ZUT z dnia 30 października 2023 r.

Kynologia, studia pierwszego stopnia (na podstawie uchwały nr 2 Senatu ZUT z dnia 25 stycznia 2016 r.)

Programme of study: *cynology*

Educational cycle: first cycle studies

Educational profile: practical

Educational areas: within the scope of agricultural sciences, forestry and veterinary

Name of qualification/title obtained: inżynier

Description of the planned educational effects

Code	Learning outcome for the programme
Knowledge	
Kn_1P_W01	Has general knowledge of application nature and knows the terminology and concepts, the theories and laws within the scope of biology, chemistry, mathematics and Information Technology
Kn_1P_W02	Has, depending on the subjects studied, elementary humanistic, social and legal knowledge enabling understanding of social and economic phenomena and processes
Kn_1P_W0[3]	Has basic knowledge within the scope of systematics and taxonomy of Prokaryotes and Eukaryotes within the scope of factographic description and phylogenetic reconstruction as well as their structure, development, multiplication, occurrence and biological as well as economic significance
Kn_1P_W04	Knows fundamental mechanisms of inheriting traits in animals, including foundations of population genetics
Kn_1P_W05	Knows the construction and usage of basic measurement equipment, machines and devices as well as technical facilities used as a part of the programme of study
Kn_1P_W06	Knows the methods of breeding, assessment of the breeding and use value of animals and the methods of selection and the types of animal crossbreeding
Kn_1P_W07	Has basic knowledge within the scope of biology, microbiology, immunology and related sciences adjusted to the programme of study
Kn_1P_W08	Has knowledge within the scope of structure and functioning of living organisms on various levels of complexity
Kn_1P_W09	Demonstrates the knowledge of basic diagnostic methods as well as techniques and tools enabling the use and shaping of living organisms in order to improve the quality of life of animals, including in particular dogs
Kn_1P_W10	Has knowledge on the subject of molecular processes occurring on the level of a genome, transcriptome, proteome and metabolome as well as their influence on shaping of the phenotype
Kn_1P_W11	Knows basic techniques used in the analysis of quality and nutritional value of feeds and the scope of their use as well as the occupational safety rules for laboratories
Kn_1P_W12	Knows the principles and techniques of feeding animals as well as the methods of producing feeds
Kn_1P_W13	Characterises breeds of dogs, knows the directions and the manners of using them

Code	Learning outcome for the programme
Kn_1P_W14	Enumerates the chemical composition, the active and anti-nutritional substances contained in raw materials for producing feeds
Kn_1P_W15	Has basic knowledge within the scope of economics, labour law, protection of intellectual property and patent law
Kn_1P_W16	Has knowledge of a foreign language on B2 level and basic vocabulary in a foreign language within the scope of the field of study.
Kn_1P_W17	Has general knowledge of social sciences and humanities within the scope of the programme of study
Kn_1P_W18	Knows basic principles of economics and marketing, explains the functioning of individual entrepreneurship within the scope of the programme of study
Kn_1P_W19	Knows basic provisions and regulations of dog shows, demonstrations, contests, competitions and test work in cynology
Kn_1P_W20	Has basic knowledge within the scope of psychology, sociology and animal aetiology, including in particular canids
Kn_1P_W21	Has knowledge on the subject of selected dog diseases, their aetiology, symptoms and methods of prevention
Kn_1P_W22	Has basic knowledge within the scope of shaping the zootechnical environment and its influence on animal welfare
Kn_1P_W23	Has knowledge of technical engineering tasks adjusted to the programme of study
Kn_1P_W24	Has basic knowledge within the scope of biology of game species as well as knows the principles of managing the populations of wild animals
Skills	
Kn_1P_U01	Is able to analyse information within the scope of structure and functioning of nucleic acids and can use them later in breeding practice; has the ability to assess the main metabolic pathways and the mechanisms of their regulation
Kn_1P_U02	Based on commonly used methods of laboratory and molecular diagnostics, is able to conduct basic analytic procedures, including also with the use of basic bioinformatic tools; interprets the results of conducted experiments
Kn_1P_U03	Has basic ability of evaluating the phenomena influencing the condition of the natural environment and the natural resources. Is able to apply basic biological laws, including genetic ones, and to forecast the positive and negative results of their action in various animals, including domesticated ones
Kn_1P_U04	Uses, in a skilful manner, computer tools, Internet sources of information and statistical methods for solving practical problems characteristic for the programme of study
Kn_1P_U05	Assesses the nutritional needs of dogs and other domesticated animals; balances the total and metabolic energy and evaluates individual nutrients of diet components, determines the body weight, performs scoring of a dog's condition, is able to produce feeds and estimates their quality and nutritional value
Kn_1P_U06	Is able to perform basic analyses of raw materials for production of feeds and use elementary equipment in an analytic laboratory in compliance with the safety rules
Kn_1P_U07	Has the ability to assess and determine the character, temperament and temper of a dog; is able to select the methods and tools of training work in the aspect of individual and group work; has the ability to use verbal and non-verbal commands depending on the type of use as well as the ability to maintain training documentation
Kn_1P_U08	Is able to interpret the behaviour and emotional states of animals during observation and work with them
Kn_1P_U09	Has the ability to undertake activities with the use of suitable methods, techniques and tools, solving problems concerning engineering tasks compliant with the programme of study
Kn_1P_U10	Is able to use basic monitoring methods and principles as well as manage the animal breeding processes, including in particular dogs

Code	Learning outcome for the programme
Kn_1P_U11	Is able to recognise the symptoms of most frequently occurring diseases of domesticated animals using suitable diagnostic methods for this purpose; depending on the age and physiological condition of an animal, is able to use proper health prophylaxis programmes
Kn_1P_U12	Is able to prepare the zoohygenic environment for the needs of domestic animals taking into consideration the animal rights and welfare
Kn_1P_U13	Has the ability to act in conditions threatening the life and health of an animal
Kn_1P_U14	Is able to perform daily and periodic care of dogs, including in particular their fur; has basic skills of preparing dogs for shows and demonstrations using suitable techniques and tools
Kn_1P_U15	Has a practical ability to use legal and ethical norms as well as economic principles within the scope of breeding, rearing and using of dogs; has practical ability to work with cynologic documentation, including mainly breeding and use
Kn_1P_U16	Has the ability to use a foreign language in a verbal and written form on B2 level of the Common European Framework of Reference for Languages
Kn_1P_U17	Applies the principles of proper nutrition and healthy lifestyle
Kn_1P_U18	Demonstrates the ability to organise the breeding and rearing of various types of domesticated animals and managing of the populations of wild animals
Social competences	
Kn_1P_K01	Has awareness of the roles and significance of domestic animals in human life
Kn_1P_K02	Demonstrates readiness for a factual and substantive discussion enabling reaching of a common position
Kn_1P_K03	Has the awareness of the level of his/her knowledge and skills as well as understands the need of life-long professional and personal education
Kn_1P_K04	Is able to work alone and in a team as well as demonstrates creativity and entrepreneurship in organisation of the performance of the assigned tasks
Kn_1P_K05	Is aware of the role of psychophysical fitness for proper performance of jobs related to cynology
Kn_1P_K06	Is convinced about the necessity to comply with the principles of professional ethics while working with animals; is careful while formulating opinions on the subject of social and ideological issues referring to theory and practice of breeding, rearing and using of dogs Demonstrates a positive attitude towards people, living organisms and environment as well as sensitivity to their needs and problems
Kn_1P_K07	Appreciates the significance of cynology and related disciplines for proper development of local and regional communities

Załącznik nr 4

do zarządzenia nr 120 Rektora ZUT z dnia30 października 2023 r.

Kynologia, studia drugiego stopnia (na podstawie uchwały nr 53 Senatu ZUT z dnia 24 września 2018 r)

Programme of studies: *cynology*

Level of qualification: second cycle studies

Educational profile: general academic

Fields of science: Agricultural sciences

Discipline of science: animal science and fisheries (100%)

Name of qualification (Title conferred): magister inżynier

Description of the planned educational effects

Code	Learning outcomes for programme of studies
Knowledge	
Kn_2A_W01	Has in-depth knowledge on economic, legal, ethical and humanistic aspects in cynology
Kn_2A_W02	Knows principles of safe work in laboratory and with animals
Kn_2A_W03	Has in-depth knowledge on ecology of Canidae and has extended understanding of the need of preservation of natural environment and sustained use of biodiversity
Kn_2A_W04	Has extended knowledge on operational systems, computer software and databases useful in a cynologist's work
Kn_2A_W05	Has in-depth knowledge on chemical composition, active, antinutritive and harmful substances contained in raw materials used in canine nutrition
Kn_2A_W06	Has in-depth knowledge on principles and techniques of canine nutrition and methods of feed production
Kn_2A_W07	Has extended knowledge on biochemistry and a dog's body structure and functioning; understands morphological and functional interconnections of tissues and organs
Kn_2A_W08	Has in-depth knowledge on various aspects of reproduction in Canidae and accompanying animals
Kn_2A_W09	Knows research techniques and principles of preparing and writing a scientific paper
Kn_2A_W10	Has extended knowledge on microbiology, immunology and related sciences and knows mechanisms of body defensive reactions to various substances and pathogens

Code	Learning outcomes for programme of studies
Skills	
Kn_2A_U01	Uses a foreign language at level B2+, communicates in everyday and professional situations, can draw up selected issues in cynology
Kn_2A_U02	Uses specialised IT tools, the Internet sources of information and statistical methods for solving problems connected with a cynologist's work
Kn_2A_U03	Independently plans and conducts experiments/measurements using appropriate research techniques and tools; interprets obtained results and draws conclusions
Kn_2A_U04	Independently analyses factors influencing food production and quality and dogs' and other animals' health
Kn_2A_U05	Independently analyses factors influencing the state of natural environment
Social competences	
Kn_2A_K01	Is aware of legal and ethical problems at individual stages of experimenting on animals and working with animals
Kn_2A_K02	Understands the need for life-long learning in general and specialised knowledge in order to develop professional achievements
Kn_2A_K03	Understands the significance of knowledge in solving cognitive and practical problems
Kn_2A_K04	Is ready to meet social obligations and act for social environment

Załącznik nr 5

do zarządzenia nr 120 Rektora ZUT z dnia 30 października 2023 r.

Zootechnika, studia pierwszego stopnia (na podstawie uchwały nr 59 Senatu ZUT z dnia 26 czerwca 2019 r.)

Programme of studies: *animal husbandry*

Level of qualification: first cycle studies

Educational profile: general academic

Fields of science: Agricultural sciences

Discipline of science: animal science and fisheries (100%)

Name of qualification (Title conferred): inżynier

Description of the planned educational effects

Code	Learning outcomes for programme of studies
Knowledge	
ZO_1A_W01	shows general knowledge of biology, chemistry, mathematics and physics as well as related sciences adapted to programme of studies “animal husbandry”
ZO_1A_W02	show basic knowledge of economics, labour law, intellectual property protection and patent law
ZO_1A_W03	shows command of a foreign language at level B2 and knowledge of basic vocabulary of animal sciences
ZO_1A_W04	has basic knowledge of growth and development of livestock
ZO_1A_W05	has general knowledge of structure and functioning of living organisms at a level of a cell, tissue, single organism and population with consideration of various levels of biosphere organisation
ZO_1A_W06	has knowledge of organisation and conducting technical engineering tasks adapted to programme of studies “animal husbandry”
ZO_1A_W07	has knowledge of shaping natural environment, its role and significance, threats and methods of protection and sustainable use
ZO_1A_W08	has basic knowledge of rural area functioning, characterises factors influencing their development
ZO_1A_W09	has general knowledge of basic problems connected with animal sciences
ZO_1A_W10	knows methods, techniques and technologies of raising, breeding and using animals and has knowledge of processing and commodity assessment of agricultural products
ZO_1A_W11	shows general knowledge of social sciences and humanities and has some knowledge of animal related aspect of those sciences
ZO_1A_W12	has basic knowledge of using animals and selection, matching and assessment of use and breeding value
ZO_1A_W13	has knowledge of animal feeding and fodder standardisation taking into consideration species, age, physiological condition and direction of use, and has some knowledge in basic issues of human nutrition
ZO_1A_W14	has knowledge of shaping zoohygienic environment and its influence on productivity and wellness of animals
ZO_1A_W15	knows fundamentals of veterinary prevention and dietetics
ZO_1A_W16	defines basic principles of economics and marketing in animal production, explains functioning of individual entrepreneurship in agricultural activities

Code	Learning outcomes for programme of studies
Skills	
ZO_1A_U01	Shows skill of finding, understanding, analysis and creative use of needed information from various sources and in various forms in the field of animal husbandry
ZO_1A_U02	Can use basic principles of humanism and ethics in connection with historical development of animal sciences
ZO_1A_U03	Shows a skill of precise, concise and appropriate processing of materials
ZO_1A_U04	Shows readiness for argumentative and substantive discussion enabling reaching consensus with various subjects
ZO_1A_U05	Uses basic information technologies in acquiring and processing information. Can operate appropriate computer programmes and use them in production technology, management, raising and improving animals. Can draw up organisational and technological guidelines of animal production and organise groups of producers in order to improve production efficiency
ZO_1A_U06	Can use a modern foreign language. Uses vocabulary concerning animal and plant production at level B2 of the Common European Framework of Reference of the Council of Europe
ZO_1A_U07	Completes simple research tasks concerning widely understood animal sciences under supervision of a tutor and draws correct conclusions
ZO_1A_U08	Understands interrelations between structure and function at a level of cells, tissues, single organisms and population
ZO_1A_U09	Can use routine optimisation techniques influencing plant and animal production, food quality, animal and human health
ZO_1A_U10	Can use appropriate methods and tools for solving problems in food production, animal and human health. Can present fundamentals of functional and convenience food; understands principles of proper nutrition of animals and humans, uses principles of proper nutrition and healthy lifestyle
ZO_1A_U11	Can solve technical engineering tasks in the field of animal husbandry
ZO_1A_U12	Assessment of weaknesses and strengths of standard activities solving occurring professional problems for gaining experience and improvement of engineering skills
ZO_1A_U13	Shows a skill of presenting own position and opinions and of communicating with various subjects in verbal, written and graphic form
ZO_1A_U14	Assesses wellness of animals and takes action in order to optimise it
ZO_1A_U15	Shows a skill of managing herds of various species of domesticated and wild animals
ZO_1A_U16	Can determine demand of animals for nutrients, can assess quality of fodder, properly balance food doses and supervise preparation of fodder
ZO_1A_U17	Shows a skill of proper use of animals and uses basic principles of breeding them
ZO_1A_U18	Can apply basic genetic laws and predict outcomes of their application in various animal populations
ZO_1A_U19	Can manage breeding use of animals
ZO_1A_U20	Uses principles of economics and marketing for animal production optimisation
ZO_1A_U21	Can assess state of environment and natural resources as well as threats resulting from raising and breeding of animals

Code	Learning outcomes for programme of studies
Social competences	
ZO_1A_K01	is able to work both individually and in team and to manage teams in appointing and controlling tasks carried out as part of planned routine work
ZO_1A_K02	acts according to basic principles of ethics in using animals and food production
ZO_1A_K03	presents pro-ecological attitude and attitude of responsibility for surrounding animate world at different levels of its organisation resulting from the awareness of risk relating to the use of various production resources
ZO_1A_K04	can think and act in an entrepreneurial way
ZO_1A_K05	is aware of the need of functioning leaders setting the directions of actions in social and professional environment
ZO_1A_K06	can acquire information from literature, databases and other sources within the programme of studies
ZO_1A_K07	shows positive opinions and attitudes towards people, organisms and environment and shows high sensitivity to their needs and problems

Załącznik nr 6

do zarządzenia nr 120 Rektora ZUT z dnia 30 października 2023 r.

Zootechnika, studia drugiego stopnia (na podstawie uchwały nr 24 Senatu ZUT z dnia 23 kwietnia 2018 r.)

Programme of studies: *animal husbandry*

Level of qualification: second cycle studies

Educational profile: general academic

Fields of science: Agricultural sciences

Discipline of science: animal science and fisheries (100%)

Name of qualification (Title conferred): magister inżynier

Description of the planned educational effects

Code	Learning outcomes for programme of studies
Knowledge	
ZO_2A_W01	in an in-depth degree knows kinds of experiments and methods, techniques of research as well as knows basic theories in natural sciences that can be applied in animal husbandry
ZO_2A_W02	has in-depth economic, legal, ethical and humanistic knowledge relating to animal husbandry sciences
ZO_2A_W03	has in-depth knowledge of influence of animal husbandry environment on health and productivity of animals and has an extended knowledge on animal husbandry prevention as an important element of animal production
ZO_2A_W04	has advanced knowledge on the structure, development, growth and functioning of living organisms at various levels of biosphere organisation
ZO_2A_W05	has in-depth knowledge on fodder and food assessment and their medicinal and promoting health value
ZO_2A_W06	has advanced knowledge of breeding work organisation and planning, including the use of IT tools, and also knowledge of food products quality assessment and management of animal products turnover
ZO_2A_W07	has extended knowledge of rural areas functioning, possibilities and factors of their development
ZO_2A_W08	has in-depth knowledge of natural environment and its role, significance and methods of protection in sustainable use
ZO_2A_W09	has in-depth knowledge of principles of rational nutrition, diseases and raising livestock, pet animals, laboratory animals and management of wild animal populations as well as their use for improvement of human life quality
ZO_2A_W10	has in-depth knowledge of taking and organising action in animal husbandry maintaining basic principles of safety and ergonomics od work and shaping individual entrepreneurship
ZO_2A_W11	has in-depth knowledge on reproductive processes, most common disorders and biotechniques used in animal reproduction

Code	Learning outcomes for programme of studies
Skills	
ZO_2A_U01	Shows in-depth skill of finding, understanding, analysis and creative use of needed information from various sources and in different forms in animal husbandry
ZO_2A_U02	Has in-depth skills in animal production organisation, turnover of animal products, technologies used in processing animal raw materials and possibility of using therapeutic properties of animals and animal products
ZO_2A_U03	Shows ability of analytical, critical and appropriate preparation of materials and formulating independent conclusions
ZO_2A_U04	Can conduct a matter-of-fact and factual discussion with various subjects leading to reaching mutual solution of a problem
ZO_2A_U05	Can use a foreign language at level B2+ of the Common European Framework of Reference, can communicate in everyday and work-related situations, uses professional vocabulary concerning animal husbandry
ZO_2A_U06	Conducts research tasks under the supervision of a tutor concerning widely understood animal sciences and draws appropriate conclusions and prepares written papers in the field of animal husbandry
ZO_2A_U07	Analyses and interprets interrelations between structure and function at a level of cells, tissues, single organisms and populations
ZO_2A_U08	Makes independent multifaceted analysis of problems in order to optimise phenomena influencing plant and animal production, food quality, animal and human health
ZO_2A_U09	Can assess and predict outcomes of proecological influence of animals on environment surrounding them
ZO_2A_U10	Can select and use advanced research techniques and tools necessary in scientific work in the discipline of animal husbandry
ZO_2A_U11	Shows skills of organising breeding and keeping of various domesticated animal species and managing of populations of wild animals
ZO_2A_U12	Can assess and determine usefulness of various nutrients and nutrition additives in human and animal nutrition in order to optimise it
ZO_2A_U13	Chooses appropriate methods of bioengineering in animal breeding and assesses results of their application
ZO_2A_U14	Can choose, draw up and use appropriate methodology of activities in order to optimise breeding processes in animals
ZO_2A_U15	Can various activities in rural areas with possibility of using IT technologies as well as marketing and economic tools
Social competences	
ZO_2A_K01	Works independently and in team, can take a leading role
ZO_2A_K02	Shows awareness of the need of gaining additional knowledge and self-improvement in animal husbandry
ZO_2A_K03	Shows understanding of the role of joint activities in animal breeders associations and institutions of agricultural counselling
ZO_2A_K04	Shows critical attitude towards information available in public space concerning animal husbandry sciences and is ready to solve various problems within his profession
ZO_2A_K05	Is able to initiate and organise social activities for the public interest and to think and act in an entrepreneurial manner
ZO_2A_K06	Is determined to responsibly play the role of a animal husbandry adapting it current social needs and to contribute with his attitude to elevate the significance of the profession, in particular by observing the principles of professional ethics
ZO_2A_K07	Acts according to principles of ethics in animal research
ZO_2A_K08	Can consciously assess environmental factors that are hazards for humans and animals
ZO_2A_K09	Shows high sensitivity to needs of humans and animals and surrounding environment

Załącznik nr 7

do zarządzenia nr 120 Rektora ZUT z dnia 30 października 2023 r.

Biotechnologia, studia drugiego stopnia (na podstawie uchwały nr 107 Senatu ZUT z dnia 31 maja 2021 r)

Programme of studies: *Biotechnology*

Level of qualification: second cycle studies

Educational profile: general academic

Fields of science: Agricultural sciences, Natural sciences, Engineering and technology

Discipline of science: animal science and fisheries (60%), nutrition and food technology (10%), agriculture and horticulture (10%) biological sciences (5%), materials engineering (10%), chemical engineering (5%)

Name of qualification (Title conferred): magister inżynier

Description of the planned educational effects

Code	Learning outcomes for programme of studies
Knowledge	
BT_2A_W01	has extended knowledge of biology, chemistry, mathematics, physics, and related sciences adjusted to biotechnology
BT_2A_W02	has in-depth knowledge of economics, quality management, law, and other aspects useful for a biotechnologist
BT_2A_W03	knows ethical, legal, economic standards, and other circumstances that are significant in biotechnology
BT_2A_W04	has detailed and organised knowledge of using molecular, enzymatic, and physiological processes of living organisms in biotechnology
BT_2A_W05	shows in-depth knowledge of structure, function, and computer analysis of genes and genomes, as well as the influence of genetic factors on environment development
BT_2A_W06	has knowledge of advanced laboratory methods, engineering techniques and tools allowing to perform tasks adjusted to study of biotechnology
BT_2A_W07	has extended knowledge of engineering processes, devices and technological lines used in biotechnology
BT_2A_W08	shows in-depth and organised knowledge of using biotechnological processes and methods in various branches of science and industry
BT_2A_W09	knows research techniques and principles of preparing and writing a scientific paper
BT_2A_W10	shows advanced knowledge of the influence of human activities on natural environment and its biodiversity
BT_2A_W11	has extended knowledge of the influence of biotechnology on human health and functioning, and on animal and plant production development
BT_2A_W12	has enriched knowledge of genetic modifications and their significance for humans and natural environment
BT_2A_W13	shows in-depth knowledge of modern breeding with significance in urban areas development
BT_2A_W14	knows advanced bioinformatics techniques and possibilities of their use in biotechnology

Code	Learning outcomes for programme of studies
Skills	
BT_2A_U01	uses in-depth theoretical knowledge to analyse processes and phenomena affecting the improvement of life and health of animals and humans
BT_2A_U02	can plan and analyse biotechnological research using bioinformatics tools
BT_2A_U03	knows a foreign language at B2+ level, communicates in everyday and professional situations, can write a report and an essay on a familiar topic; has a skill of preparing oral presentations containing biotechnological vocabulary
BT_2A_U04	analyses factors influencing food production, quality, and safety; analyses factors influencing natural environment; determines the influence and significance of biotechnology in natural environment and biodiversity protection
BT_2A_U05	can execute an experimental process individually or in a team, including making measurements that can be used in biotechnology; interprets obtained results and draws conclusions; conducts a discussion basing on individually acquired knowledge using specialist language
BT_2A_U06	makes thorough molecular analysis of basics of evolution, and also factors affecting functioning of genome and transcriptome; analyses factors affecting organism variability
BT_2A_U07	analyses main metabolic pathways and mechanism of their adjustment basing on knowledge of structure and function of proteins, hormones, and vitamins; can obtain and use enzymes
BT_2A_U08	selects and uses advanced research techniques and tools applied in biotechnology
BT_2A_U09	uses learned methods in research; prepares literature in accordance with research profile; analyses scientific reports in the context of own research project; can prepare project of own scientific research and individually prepare a scientific paper
BT_2A_U10	observes basic principles of good laboratory practice; can determine threats in biotechnologist's work, can react in dangerous situations using principles of industrial safety
Social competences	
BT_2A_K01	shows the need of constant improvement of general and specialised knowledge; is aware of advisability of improving the acquired knowledge both in professional activities and in personal development
BT_2A_K02	shows understanding of biotechnological processes used in various fields of human activities; interprets and describes the processes using scientific approach
BT_2A_K03	is aware of the influence of biotechnology on the development and state of natural environment, and on human health
BT_2A_K04	is aware of existing ethical and social standards concerning conducted research and professional activities; understands the advisability of acting according to the established ethical and legal principles
BT_2A_K05	shows discipline in individual work; willingly participates in group work; can creatively plan and execute own and team activities
BT_2A_K06	shows responsibility for decisions and their effects; presents a matter of fact and critical attitude
BT_2A_K07	understands advisability of stimulating individual cognitive activities and improving professional competence; shows independence in acquiring scientific information from different sources
BT_2A_K08	is aware of joint responsibility for his/her and other people's work safety; can think and act in an entrepreneurial manner