ZARZĄDZENIE NR 49

Rektora Zachodniopomorskiego Uniwersytetu Technologicznego w Szczecinie z dnia 30 czerwca 2017 r.

zmieniająca zarządzenie nr 30 Rektora ZUT z dnia 25 września 2014 r. w sprawie opisu efektów kształcenia w tłumaczeniu na język angielski

dla poszczególnych kierunków studiów prowadzonych w ZUT

Na podstawie art. 66 ust. 2 w związku art. 167 ust. 1 ustawy z dnia 27 lipca 2005 r. Prawo o szkolnictwie wyższym (tekst jedn. Dz. U. z 2016 r., poz. 1842, z późn. zm.) oraz § 11 ust. 2 rozporządzenia Ministra Nauki i Szkolnictwa Wyższego z dnia 16 września 2016 r. w sprawie dokumentacji przebiegu studiów (Dz. U. poz. 1554), w oparciu o uchwały Senatu ZUT sprawie określenia opisu efektów kształcenia dla poszczególnych kierunków, zarządza się, co następuje:

§ 1.

W zarządzeniu nr 30 Rektora ZUT z dnia 25 września 2014 r. w sprawie opisu efektów kształcenia w tłumaczeniu na język angielski dla poszczególnych kierunków studiów prowadzonych w ZUT, z późn. zm., wprowadza się zmiany:

1) dodaje się opisy efektów kształcenia w tłumaczeniu na język angielski dla poniższych kierunków studiów, stanowiące załącznik do niniejszego zarządzenia:

a) w załączniku nr 1 – Wydział Biotechnologii i Hodowli Zwierząt: kynologia *(*cynology), pierwszego stopnia,

b) w załączniku nr 2 – Wydział Budownictwa i Architektury: projektowanie architektury wnętrz i otoczenia(interior and exterior design)*,* pierwszego stopnia,

c) w załączniku nr 6 – Wydział Inżynierii Mechanicznej i Mechatroniki: energetyka (power engineering)*,* drugiego stopnia,

d) w załączniku nr 7 – Wydział Kształtowania Środowiska i Rolnictwa: uprawa winorośli i winiarstwo (viticulture and winemaking), pierwszego stopnia,

e) w załączniku nr 8 – Wydział Nauk o Żywności i Rybactwa: mikrobiologia stosowana (applied microbiology)*,* drugiego stopnia,

f) w załączniku nr 9 – Wydział Techniki Morskiej i Transportu: chłodnictwo i klimatyzacja (refrigeration and air conditioning), drugiego stopnia;

2) w załączniku nr 9 – Wydział Techniki Morskiej i Transportu: dla kierunku studiów oceanotechnika, drugiego stopnia (ocean technology, second cycle studies):

a) w części "Knowledge" w kolumnie “Code” O\_2A\_W16 do O\_2A\_W18 opisy efektów kształcenia otrzymują brzmienie:

|  |  |
| --- | --- |
| O\_2A\_W16 | has structured and enhanced knowledge within the scope of functioning of power engineering devices and systems in ocean technology structures based on theory-based knowledge within the scope of thermodynamics and heat exchange |
| O\_2A\_W17 | has structured and supported knowledge within the scope of functioning of refrigeration and air-conditioning devices and systems in ocean technology structures |
| O\_2A\_W18 | has structured and supported knowledge within the scope of functioning of security devices and systems in ocean technology structures |

b) w części "Skills" w kolumnie “Code” O\_2A\_U03, od O\_2A\_U20 do O\_2A\_U22 i O\_2A\_24 opisy efektów kształcenia otrzymują brzmienie:

|  |  |
| --- | --- |
| O\_2A\_U03 | is able to prepare a scientific publication in English or another foreign language considered to be a language of international communication within the scope of ocean technology presenting the results of his/her research compiled in the diploma dissertation  |
| O\_2A\_U20 | is able to formulate and explain the principles of functioning of power engineering devices and systems in ocean technology structures |
| O\_2A\_U21 | is able to formulate and explain the principles of functioning of refrigeration and air-conditioning devices as well as installations used in ocean technology structures taking non-technical aspects into consideration  |
| O\_2A\_U22 | is able to formulate and explain the principles of functioning of security devices and systems in ocean technology structures |
| O\_2A\_U24 | is able to formulate and explain the principles of conducting thermodynamic analyses of thermal processes |

§ 2.

Zarządzenie wchodzi w życie z dniem podjęcia.

Rektor

dr hab. inż. Jacek Wróbel, prof. nadzw.

Załącznik do zarządzenia nr 49 Rektora ZUT z dnia 30 czerwca 2017 r.

(Załącznik nr 1 – Faculty of Biotechnology and Animal Husbandry)

Programme of study: cynology[[1]](#footnote-1)

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

|  |  |
| --- | --- |
| 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\_W03 | 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 |
| 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 |
| 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 dogsDemonstrates 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 2 – Faculty of Civil Engineering and Architecture)

Programme of study: interior and exterior design[[2]](#footnote-2)

Educational cycle: first cycle studies

Educational profile: general academic

Educational areas: within the scope of technical sciences and arts

Name of qualification/title obtained: inżynier

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| --- | --- |
| Code | Learning outcomes for the programme |
| Knowledge |
| PAWiO\_1A\_W01 | has knowledge from selected areas of exact sciences used for solving design and planning problems (mathematics, mechanics of buildings, building constructions) |
| PAWiO\_1A\_W02 | has basic knowledge concerning technologies and materials used in interior design and civil engineering (assortment, characteristics, usage) |
| PAWiO\_1A\_W03 | is able to characterise materials used in interior architecture and its direct surrounding as regards their basic technological features and possibilities of using them in design  |
| PAWiO\_1A\_W04 | knows, within a basic scope, modern tendencies in design and execution of buildings and elements surrounding architecture  |
| PAWiO\_1A\_W05 | knows the graphic representation of an engineering project, is able to read it and subject it to processing with the use of computer technology  |
| PAWiO\_1A\_W06 | has basic knowledge within the scope of building systems |
| PAWiO\_1A\_W07 | has basic knowledge about a human being within the scope of ergonomics, psychophysiology, the needs of the disabled |
| PAWiO\_1A\_W08 | has well-developed artistic sensitivity and knowledge within the scope of aesthetic theories |
| PAWiO\_1A\_W09 | has knowledge of colour and hue; understands their importance for composition and influence on form perception |
| PAWiO\_1A\_W10 | knows the basics of form construction, the elements and the principles of spatial composition as well as the relationship between space shaping elements |
| PAWiO\_1A\_W11 | has knowledge within the scope of engineering workshop techniques and execution of artistic works related to the architecture of interiors and their surrounding |
| PAWiO\_1A\_W12 | knows basic legal conditions concerning design of various categories of buildings |
| PAWiO\_1A\_W13 | knows, within a basic scope, selected computer programmes aiding design |
| PAWiO\_1A\_W14 | knows ecological conditions of design and planning (the idea of sustainable development) within a basic scope |
| PAWiO\_1A\_W15 | knows basic forms and principles of protection and revitalisation of cultural heritage and the methods used in the process of this protection |
| PAWiO\_1A\_W16 | has elementary knowledge within the scope of materials used in architectural and urban interiors |
| PAWiO\_1A\_W17 | knows the foundations of the history of architecture, design, art and exterior design |
| PAWiO\_1A\_W18 | knows basic geodetic methods of topography mapping and development of technical infrastructure  |
| PAWiO\_1A\_W19 | has basic knowledge within the scope of humanistic contents as well as other issues within the scope of culture supplementing technical education |
| PAWiO\_1A\_W20 | has elementary knowledge within the scope of professional ethics |
| PAWiO\_1A\_W21 | has basic knowledge within the scope of photography and visual communication |
| PAWiO\_1A\_W22 | knows the principles of organising construction processes including costing |
| PAWiO\_1A\_W23 | knows the issues related to protection of intellectual property |
| PAWiO\_1A\_W24 | has basic knowledge in the area of relations between a human being and a technical object |
| PAWiO\_1A\_W25 | knows basic issues within the scope of designing human surrounding |
| PAWiO\_1A\_W26 | has general knowledge of printing and multimedia processes and understands the principles of their rational use; has elementary knowledge within the scope of information technologies, including multimedia |
| PAWiO\_1A\_W27 | knows basic concepts within the scope of management and marketing, understands market phenomena in the context of investor-designer project execution |
| PAWiO\_1A\_W28 | understands the market role of interiors and interior designers, knows tendencies and directions of economic development |
| Skills |
| PAWiO\_1A\_U01 | is able to keep fit, taking into consideration the specificity of the profession |
| PAWiO\_1A\_U02 | uses a foreign language on B2 level, including the knowledge of specialist vocabulary |
| PAWiO\_1A\_U03 | is able to perform simple geodetic works, interprets land shaping and designs small earth works |
| PAWiO\_1A\_U04 | is able to design detailed technical solutions in the interior and exterior of a building  |
| PAWiO\_1A\_U05 | constructs and calculates alone the load capacity of basic construction elements; is able to design the construction of small structures |
| PAWiO\_1A\_U06 | has basic ability of recognising and using the construction systems, building installations and technologies |
| PAWiO\_1A\_U07 | has the ability to draw, sculpt and paint efficiently with the use of various tools, materials and techniques, including computer ones |
| PAWiO\_1A\_U08 | is able to express design ideas with the use of virtual and traditional modelling techniques |
| PAWiO\_1A\_U09 | has the ability to develop a colour scheme in interior and exterior design |
| PAWiO \_1A\_U10 | uses in practice the principles of shaping spatial forms in various contexts and scales |
| PAWiO \_1AU11 | has the ability to determine the interior utility programme and uses basic principles of designing spaces of various functions with the use of suitable materials |
| PAWiO \_1A\_U12 | has the ability to create architectural interiors and their direct surrounding in a specific style |
| PAWiO\_1A\_U13 | is able to present a project in an attractive graphic form and in the form of a multimedia presentation |
| PAWiO\_1A\_U14 | is able to obtain an intended aesthetic effect in an architectural project with the use of suitable materials with specific plastic properties |
| PAWiO\_1A\_U15 | has the ability to shape the scenography space |
| PAWiO\_1A\_U16 | is able to design the lighting conditions in the architecture of interiors and their direct surrounding |
| PAWiO\_1A\_U17 | has the ability to design proper acoustic conditions in interiors |
| PAWiO\_1A\_U18 | has basic ability of designing architectural interiors |
| PAWiO\_1A\_U19 | has basic ability of designing the direct surrounding of architecture |
| PAWiO\_1A\_U20 | has the ability to solve architectural issues related to ecological problems |
| PAWiO\_1A\_U21 | is able to use in practice the knowledge within the scope of selecting materials and technologies for various architectural interiors in their direct surrounding |
| PAWiO\_1A\_U22 | is able to develop various types of technical documentation (inventory, conceptual, construction and executive projects, as-built surveys)  |
| PAWiO\_1A\_U23 | has the ability to use computer software (architectural design, graphic, visual) |
| PAWiO\_1A\_U24 | is able to use in practice the legal provisions and interpret them properly in compliance with the principles of professional ethics |
| PAWiO\_1A\_U25 | is able to use the occupational health and safety rules in practice |
| PAWiO\_1A\_U26 | is able to use the knowledge gained about a human being within the scope of ergonomics, psychophysiology, the needs of the disabled in the design process |
| PAWiO\_1A\_U27 | is able to use knowledge within the scope of economics and marketing to take rational decisions in business activity |
| PAWiO\_1A\_U28 | is able to use photography and aspects of visual communication in presentation of projects |
| PAWiO\_1A\_U29 | is able to organise and supervise construction processes including costing |
| PAWiO\_1A\_U30 | has the ability to use the knowledge gained within the scope of protection and revitalisation of the cultural heritage as well as methods used in the process of this protection |
| PAWiO\_1A\_U31 | is able to use analytic, simulation and experimental methods to formulate and solve engineering tasks |
| Social competences |
| PAWiO\_1A\_K01 | understands the need of life-long learning and is able to inspire others to learn  |
| PAWiO\_1A\_K02 | is ready to work in a single-trade and multidisciplinary team, expresses his/her views and discusses them with professionals and others |
| PAWiO\_1A\_K03 | demonstrates entrepreneurship and invention in thinking, is open and communicative |
| PAWiO\_1A\_K04 | is responsible for his/her own work, behaves in a professional manner, complies with the principles of professional ethics  |
| PAWiO\_1A\_K05 | understands non-technical aspects and results of design activity (social, health) as well as its influence on the environment  |
| PAWiO\_1A\_K06 | disseminates knowledge of the architecture of interior and its direct surrounding, makes an effort to convey the knowledge gained to the society in a commonly understandable manner  |
| PAWiO\_1A\_K07 | undertakes activities for the benefit of increasing the quality of life and the environment |
| PAWiO\_1A\_K08 | is sensitive to manifestations of art in the surrounding reality, which he/she uses to build his/her own creative attitude |
| PAWiO\_1A\_K09 | has the awareness of professional communication with individual and group customers and users, understands basic relations between the needs of users and the features of space |
| PAWiO\_1A\_K10 | has the awareness of functioning of formal and legal as well as ethical conditions and designer's responsibility for decisions made in the design and executive process |
| PAWiO\_1A\_K11 | is responsible for the safety of his/her own and the team. |
| PAWiO\_1A\_K12 | has the awareness of social needs within the scope of psychophysiology and needs of the disabled  |

(Załącznik nr 6 – Faculty of Mechanical Engineering and Mechatronics)

Programme of study: power engineering[[3]](#footnote-3)

Educational cycle: second cycle studies

Educational profile: general academic

Educational areas: within the scope of technical sciences

Name of qualification/title obtained: magister inżynier

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| --- | --- |
| Code | Learning outcome for the programme |
| Knowledge |
| ENE\_2A\_W01 | Has extended and in-depth knowledge within the scope of mathematics covering: elements of applied mathematics, differential calculus and optimization methods, including numerical methods necessary for:1) Description and analysis of the operation of power engineering elements and systems;2) Description of the course of physical and chemical processes, including electrochemical ones, as well as power engineering processes |
| ENE\_2A\_W02 | Has extended knowledge within the scope of physics covering the foundations of quantum and nuclear physics, including knowledge necessary to understand the physical processes and phenomena occurring in complex power engineering systems |
| ENE\_2A\_W03 | Has detailed knowledge within the scope of principles of construction, modelling, design and operation of power engineering elements and systems |
| ENE\_2A\_W04 | Has extended knowledge within the scope of power engineering measurements as well as modern measurement systems, in particular within the scope of selecting the equipment and analysis of measurement uncertainty |
| ENE\_2A\_W05 | Has knowledge within the scope of power engineering systems used for improvement of quality and transfer of electrical energy |
| ENE\_2A\_W06 | Has extended knowledge within the scope of modelling of mechanical systems, strength analysis of basic mechanical constructions |
| ENE\_2A\_W07 | Has extended and structured knowledge within the scope of hydromechanics, thermodynamics and heat transfer |
| ENE\_2A\_W08 | Has structured and theory-based knowledge within the scope of computer aided calculations and decision making in power engineering |
| ENE\_2A\_W09 | Has structured knowledge within the scope of: managing the supply and input of energy powering the processes and facilities as well as the energy law and the energy efficiency |
| ENE\_2A\_W10 | Has extended and structured knowledge in the area of conventional and unconventional power engineering, including renewable and nuclear power engineering |
| ENE\_2A\_W11 | Has knowledge within the scope of developmental trends as regards the operation of generation sources in an electrical power engineering system, including dispersed generation and energy storage |
| ENE\_2A\_W12 | Has extended knowledge within the scope of waste management, purifying of exhaust gases, the influence of power engineering processes on the environment |
| ENE\_2A\_W13 | Has basic knowledge within the scope of materials used in power engineering industry, the life cycle of power engineering devices and systems |
| ENE\_2A\_W14 | Has elementary knowledge within the scope of management, including quality management, conducting of business activity and the principles of establishment and development of individual entrepreneurship |
| ENE\_2A\_W15 | Has basic knowledge within the scope of intellectual property protection and patent law |
| Skills |
| ENE\_2A\_U01 | Is able to obtain information from literature, data bases and other sources, also in a foreign language within the scope of power engineering; is able to integrate the obtained information, interpret it and evaluate critically as well as draw conclusions, formulate and justify opinions. |
| ENE\_2A\_U02 | Is able to work individually and in a team, to estimate the time consumption of a task, is able to manage a small team in a manner that guarantees completion of a task within a specified time limit. |
| ENE\_2A\_U03 | Is able to develop documentation concerning the accomplishment of a technical task and to prepare a text containing the description of the results of such a task. |
| ENE\_2A\_U04 | Is able to prepare and deliver a presentation on the subject of the accomplished design or research task as well as lead a discussion concerning the delivered presentation. |
| ENE\_2A\_U05 | Is able to use a foreign language to an extent sufficient to communicate, also in professional issues, read specialist literature with understanding as well as prepare and deliver a short presentation on a project or research task |
| ENE\_2A\_U06 | Has the ability to learn, for example to improve professional competences. |
| ENE\_2A\_U07 | Is able to use the mathematical methods and models learned - if necessary, modifying them appropriately - for analysis and designing of power engineering circuits and systems. |
| ENE\_2A\_U08 | Is able to plan and conduct an experiment, including measurements and computer simulations within the scope of power engineering elements and whole systems as well as interpret the obtained results |
| ENE\_2A\_U09 | Is able to select a calculation method, use suitable software for solving of a specific issue taking into consideration new achievements of technique ad technology |
| ENE\_2A\_U10 | Is able to assess the usefulness of methods and tools used in measurements, diagnostics and supporting decisions connected with power engineering processes |
| ENE\_2A\_U11 | Has preparation required for working in an industrial environment and knows the rules of occupational safety |
| ENE\_2A\_U12 | Is able to perform an economic analysis connected with investments in engineering |
| ENE\_2A\_U13 | Is able to conduct a critical analysis and assessment of a power engineering technology, propose improvements of the existing technical solutions |
| Social competences |
| ENE\_2A\_K01 | Is able to think and act in a creative and enterprising manner, understands the need to formulate and convey to the society the information and opinions concerning the achievements of power engineering and the branches of economy related to it. |
| ENE\_2A\_K02 | Identifies and solves dilemmas related to power engineering security of the state. |
| ENE\_2A\_K03 | Has the awareness of their importance and understands non-technical aspects and consequences of using various power engineering techniques, including their influence on the environment and the related responsibility for the decisions taken. |
| ENE\_2A\_K04 | Understands the need of life-long learning and increasing the professional competences as well as is able to inspire others to learn |
| ENE\_2A\_K05 | Is able to cooperate and work in a group, taking various roles in it and determining properly the priorities used for accomplishment of a task specified alone or by others. |

(Załącznik nr 7 – Faculty of Environmental Management and Agriculture)

Programme of study: viticulture and winemaking[[4]](#footnote-4)

Educational cycle: first cycle studies

Educational profile: general academic

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

Name of qualification/title obtained: inżynier

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| Code | Learning outcomes for the programme |
| Knowledge |
| UWW\_1A\_W01 | the student has knowledge within the scope of chemistry and biochemistry necessary to understand basic chemical processes occurring in plants and their living environment |
| UWW\_1A\_W02 | the student has knowledge within the scope of mathematics, mathematical statistics and physics necessary to understand basic physical phenomena occurring in nature, including climatic ones |
| UWW\_1A\_W03 | the student has knowledge within the scope of botany necessary to understand the dependencies between the structure and the function on the level of cells, tissues, individual organisms and populations as well as covering plant systematics, their origin and phytogeography |
| UWW\_1A\_W04 | the student has knowledge within the scope of physiology of horticultural plants covering mechanisms regulating the life processes of plants, the water and mineral management, transport and distribution of mineral and organic compounds in plants and their influence on crop yield |
| UWW\_1A\_W05 | the student has knowledge within the scope of information technology including obtaining and processing of information and texts, construction and use of database spreadsheets |
| UWW\_1A\_W06 | the student has knowledge within the scope of genetics and breeding, including genetic mechanism occurring on the level of cells, organisms and populations, knows general principles of breeding and biotechnology of plants |
| UWW\_1A\_W07 | the student knows methods of economic analysis, organisation and quality management, conducting business activity as well as the principles of functioning of the market of horticultural and wine products |
| UWW\_1A\_W08 | the student has knowledge within the scope of pedology and horticultural substrates, including knowledge necessary to understand the influence of soil properties on their fertility |
| UWW\_1A\_W09 | the student has knowledge within the scope of horticultural plant nutrition, the influence of organic and mineral fertilising on the soil and the natural environment |
| UWW\_1A\_W10 | the student has knowledge within the scope of ecology, protection of the environment and nature, including knowledge necessary to understand the functioning of natural ecological systems |
| UWW\_1A\_W11 | the student has knowledge within the scope of microbiology necessary to understand the phenomena occurring in the environment under the influence of microorganisms, including the use of microbiological processes in horticultural practice and wine production |
| UWW\_1A\_W12 | the student has structured knowledge necessary to protect vines and other horticultural plants  |
| UWW\_1A\_W13 | the student has knowledge within the scope of methods and technologies of horticultural and agricultural production which ensure obtaining of high quality crops |
| UWW\_1A\_W14 | the student knows the species and varieties of vines and selected horticultural plants  |
| UWW\_1A\_W15 | the student has detailed knowledge within the scope of vine cultivation technologies |
| UWW\_1A\_W16 | the student has knowledge on the subject of technical aspects of grape and wine production |
| UWW\_1A\_W17 | the student has knowledge within the scope of storage and processing of grapes and other horticultural products |
| UWW\_1A\_W18 | the student has knowledge on the subject of wine production and wine assessment |
| UWW\_1A\_W19 | the student has knowledge concerning the significance of vines and wine in economy, culture, tradition and history |
| UWW\_1A\_W20 | the student has knowledge on the subject of classification, selection and the manner of serving wine |
| UWW\_1A\_W21 | the student has basic knowledge within the scope of legal regulations, protection of intellectual property, ergonomics as well as occupational health and safety, including in particular the specificity of horticultural and wine production |
| UWW\_1A\_W22 | the student has knowledge within the scope of humanities and social sciences in connection with the field of study |
| Skills |
| UWW\_1A\_U01 | the student is able to use information technology within the scope of obtaining and processing information, construction of data bases necessary to design and carry out ventures within the scope of horticultural and wine production |
| UWW\_1A\_U02 | the student has the ability to recognise and characterise the main types of soils |
| UWW\_1A\_U03 | the student has the ability to recognise the species and varieties of vines and other horticultural plants |
| UWW\_1A\_U04 | the student has the ability to determine the biotic and abiotic dangers for horticultural crops, including in particular vines, and is able to use the methods for counteracting and combating the potential dangers |
| UWW\_1A\_U05 | the student is able to assess and select a location for cultivation of horticultural plants, including in particular vines, conducing the analysis of environmental factors influencing the development of plants |
| UWW\_1A\_U06 | the student is able to diagnose the soil richness, uses the principles of rational mineral fertilisation compliant with the needs of cultivated horticultural plant  |
| UWW\_1A\_U07 | the student is able to establish and run a fruit trees and shrubs nursery, including in particular vines, has the ability to use proper methods of breeding horticultural plants |
| UWW\_1A\_U08 | the student has the ability to plan and use basic maintenance treatments in horticulture, including in particular vineyards |
| UWW\_1A\_U09 | the student has the ability to select and plan methods and technologies of cultivation in order to obtain the best production effects, including in particular the quality of the final product and the economic analysis of the venture |
| UWW\_1A\_U10 | the student is able to conduct a critical analysis of the manner of functioning of a horticultural farm and a vineyard as regard the use of technological processes and technical solutions, uses these solutions in practice |
| UWW\_1A\_U11 | the student has the ability to design and use suitable methods and technologies of wine production |
| UWW\_1A\_U12 | the student is able to conduct quality analysis and assessment of horticultural raw materials as well as wine products, classifies wines properly |
| UWW\_1A\_U13 | the student has the ability to prepare design projects, studies, reports as well as speeches within the scope of the programme of study with the use of basic theoretical approaches as well as other sources in order to communicate precisely with institutions, producers and receivers connected with horticultural and wine production |
| UWW\_1A\_U14 | the student, led by a scientific supervisor, performs simple research or project tasks related to the programme of studies, properly interpreting the results and drawing conclusions |
| UWW\_1A\_U15 | the student uses the principles of occupational health and safety in conducting of the processes related to horticultural and wine production, is able to use legal regulations and financial resources obtained as a result of the accomplishment of national and international research projects |
| UWW\_1A\_U16 | the student uses a foreign language on B2 level of the European Framework of Reference, including basic terminology within the scope of horticulture and winemaking |
| UWW\_1A\_U17 | the student has the ability to assess the significance of issues resulting from humanities and social sciences in human life |
| UWW\_1A\_U18 | the student has the ability to search for and analyse the necessary information in order to prepare simple scientific publications |
| Competences |
| UWW\_1A\_K01 | the student assesses critically the results of the conducted activity related to the programme of studies |
| UWW\_1A\_K02 | the student is aware of the significance of knowledge in solving cognitive and practical problems |
| UWW\_1A\_K03 | the student has awareness of the need to join social activities for the benefit of environmental protection |
| UWW\_1A\_K04 | the student is able to think and act in an enterprising manner |
| UWW\_1A\_K05 | the student takes responsibility for the undertaken activities, respects the rules of professional ethics |

(Załącznik nr 8 – Faculty of Food Sciences and Fisheries)

Programme of study: applied microbiology[[5]](#footnote-5)

Educational cycle: second cycle studies

Educational profile: general academic

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

Field of study: agricultural sciences

Discipline: Food Technology and Human Nutrition

Professional title obtained by a graduate: magister inżynier

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| --- | --- |
| Code | Learning outcomes for Applied Microbiology |
| Knowledge |
| MS\_2A\_W01 | Has extended knowledge within the scope of statistical methods, information technology ad bioinformatics used in natural sciences. |
| MS\_2A\_W02 | Has knowledge within the scope of dependencies between physiology of living organisms and a genotype as well as the scope of significance of immunology and immunoprophylaxis in animal breeding. |
| MS\_2A\_W03 | Has extended knowledge on the subject of microorganisms, their specificity, variety and role in agricultural and related sciences. |
| MS\_2A\_W04 | The student has knowledge concerning microbiological and biological phenomena occurring in pedosphere, hydrosphere and biosphere. |
| MS\_2A\_W05 | Has in-depth knowledge concerning microorganisms (viruses, bacteria and fungi) and parasites as well as diagnostic methods used to detect them. |
| MS\_2A\_W06 | Has the knowledge of specialised vocabulary in a foreign language on B2+ level in a given field of study. |
| MS\_2A\_W07 | Has the knowledge concerning biotechnology of antibiotics and drug resistance. |
| MS\_2A\_W08 | Has extended knowledge on the subject of the influence of microorganisms on the quality and health safety of food as well as biotechnology of the food industry, including processing with the participation of microorganisms. |
| MS\_2A\_W09 | Has the knowledge within the scope of cell cultures and their use. |
| MS\_2A\_W10 | Has in-depth knowledge within the scope of methods of obtaining and using of the main types of biopolymers, biodegradation and biorefinery mechanisms. |
| MS\_2A\_W11 | Has extended knowledge concerning the system of management and standardisation. Has extended knowledge within the scope of legal regulations protecting intellectual property and labour law. |
| MS\_2A\_W12 | Has in-depth knowledge of harmful compounds in the environment, contamination processes and methods of determining them. |
| MS\_2A\_W13 | Has extended knowledge of the processes occurring in the environment and the dependencies among the organisms functioning in it as well as the possibilities of using them. |
| Skills |
| MS\_2A\_U01 | Has the ability to use the necessary information from various sources in Polish and a foreign language. Is able to interpret it as well as to draw conclusions, formulate and justify opinions. |
| MS\_2A\_U02 | Is able to develop documentation concerning the accomplishment of an analytic task and to prepare a text containing the description of the results of such a task as well as to present them in a verbal (presentation) and descriptive form in Polish and in a foreign language. |
| MS\_2A\_U03 | Is able to select suitable analytic procedures and methods. Is able to use in practice basic and specialist research techniques and tools suitable for applied microbiology and related sciences. |
| MS\_2A\_U04 | Is able to differentiate organisms that are pathogenic and beneficial for a human being and animals as well as determine their role in the environment. |
| MS\_2A\_U05 | Has the ability to introduce systems of management and standardisation. Is able to use in practice the knowledge within the scope of legal regulations protecting intellectual property and labour law. Is able to conduct statistical analyses used in agricultural sciences. |
| MS\_2A\_U06 | Has the abilities to work with genetic materials and cell cultures as well as use imaging techniques. |
| MS\_2A\_U07 | Is able to use the knowledge concerning the dependence of the immunological condition of animals and human beings in relation to their welfare. |
| Social competences |
| MS\_2A\_K01 | Understands the need of life-long learning and the necessity to improve professional competences. Determines the directions of his/her own development and education (third-cycle, post-diploma studies, courses). |
| MS\_2A\_K02 | Is aware of the importance of compliance with the principles of professional ethics and respect for the diversity of sexes, beliefs and cultures. |
| MS\_2A\_K03 | Is aware of the responsibility for the work safety of his/her own and the others. Is able to act in danger |
| MS\_2A\_K04 | Is able to think and act in an enterprising manner individually and in a team. |

(Załącznik nr 9 – Faculty of Maritime Technology and Transport)

Programme of study: refrigeration and air conditioning[[6]](#footnote-6)

Educational cycle: first cycle studies

Educational profile: general academic

Educational areas: within the scope of technical sciences

Field of study: technical sciences

Discipline: machine construction and operation, environmental engineering

Name of qualification/title obtained: inżynier

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| --- | --- |
| Code | Learning outcomes for *Refrigeration and Air Conditioning* |
| Knowledge |
| CK\_1A\_W01 | has knowledge within the scope of higher mathematics (including algebra, geometry, analysis, probability theory and elements of discrete and applied mathematics) within the scope necessary to formulate and solve problems as well as describe physical phenomena related to refrigeration and air conditioning |
| CK\_1A\_W02 | has knowledge within the scope of physics (including mechanics, thermodynamics, optics, electricity and magnetism, nuclear physics and solid-state physics) necessary to understand basic physical phenomena occurring in nature and enabling their use to produce heat and cold |
| CK\_1A\_W03 | has elementary knowledge within the scope of architecture of computer systems and networks as well as operating systems and programming necessary to use a computer network and network applications, computer support while solving technical and organisational problems occurring in refrigeration and air conditioning |
| CK\_1A\_W04 | has in-depth knowledge within the scope of the life cycle of technical devices, facilities and systems as well as the scope of materials science, manufacturing techniques and anti-corrosion protection |
| CK\_1A\_W05 | has in-depth knowledge concerning the principles and foundations of machine construction as well as graphic representation of basic engineering constructions and specialised ones in refrigeration and air conditioning |
| CK\_1A\_W06 | has structured knowledge within the scope of mechanics, electrical engineering, electronics, automatic control |
| CK\_1A\_W07 | has in-depth knowledge related to obtaining and conversion of energy for the needs of refrigeration and air conditioning |
| CK\_1A\_W08 | has basic knowledge necessary to understand social, economic, legal and other non-technical conditions of engineering activity |
| CK\_1A\_W09 | has knowledge within the scope of climatology and meteorology |
| CK\_1A\_W10 | has structured and theory-based knowledge within the scope of the principles of operation and construction of fluid flow and displacement machines |
| CK\_1A\_W11 | has structured knowledge within the scope of refrigeration, ventilation, heating and air conditioning |
| CK\_1A\_W12 | has structured knowledge concerning the functioning of logistics and transport refrigeration systems |
| CK\_1A\_W13 | has structured knowledge concerning the construction and operation of refrigeration and air conditioning systems as well as knows the measurement methods used in heat power engineering |
| CK\_1A\_W14 | has in-depth knowledge necessary to understand the problems of environmental protection, ecology, noise protection as well as within the scope of safety of operation of refrigeration systems |
| CK\_1A\_W15 | has general knowledge concerning the principles of designing and operation of ventilation, refrigeration and air conditioning systems as well as conducting scientific research in the area of issues related to these systems |
| CK\_1A\_W16 | knows general principles of establishing and developing of individual entrepreneurship forms |
| CK\_1A\_W17 | has detailed knowledge related to selected issues in low temperature techniques |
| CK\_1A\_W18 | knows and understands basic concepts and rules within the scope of intellectual property including patent protection |
| CK\_1A\_W19 | has in-depth knowledge within the scope of refrigeration factors, energy efficiency of devices and applied assessment indicators (e.g. COP, EER, ODP, GWP, TEWI) |
| Skills |
| CK\_1A\_U01 | has the ability to find, understand, analyse and use the necessary information; is able to analyse and interpret the obtained information, draw conclusions as well as formulate and justify opinions related to engineering activity |
| CK\_1A\_U02 | uses a foreign language in an extent sufficient to communicate as well as to read scientific publications within the scope of refrigeration and air conditioning, technological documentation and similar documents used in operation of refrigeration and air conditioning devices |
| CK\_1A\_U03 | is able to develop documentation concerning the accomplishment of an engineering task and to prepare a text containing the description of the results of such a task as well as to present them verbally (presentation) in Polish, English or another foreign language |
| CK\_1A\_U04 | is able to work individually and in a team, to estimate the time necessary for accomplishment of an assigned task, to develop and implement a work schedule |
| CK\_1A\_U05 | is able to use properly the basic information technologies necessary in his/her professional work |
| CK\_1A\_U06 | has language skills within the scope of the fields of science and scientific disciplines appropriate for the programme of study compliant with the requirements specified for B2 level of the European Framework of Reference |
| CK\_1A\_U07 | is able to plan research, conduct measurements, interpret the obtained results and draw conclusions within the scope of issues concerning refrigeration and air conditioning |
| CK\_1A\_U08 | is able to perform calculations, plan and conduct computer simulations as well as use specialist software within the scope of ventilation, refrigeration, air conditioning and heat pumps |
| CK\_1A\_U09 | has preparation necessary for working in industrial environment and in refrigeration as well as knows the safety rules connected with this work |
| CK\_1A\_U10 | while formulating and solving technological problems, is able to perceive their non-technical aspects, including the environmental, economic and legal ones on a local and regional scale; applies the occupational health and safety rules |
| CK\_1A\_U11 | is able to perform a critical analysis of the manner of functioning and evaluate the existing technical solutions used in refrigeration and air conditioning |
| CK\_1A\_U12 | is able to identify and specify simple engineering tasks of practical nature related to operation of refrigeration and air conditioning devices |
| CK\_1A\_U13 | is able to use the resources of patent information, is able to perform the assessment of the possibility of intellectual property protection |
| CK\_1A\_U14 | is able to design a simple device, object or system typical for refrigeration and air conditioning in accordance with a pre-defined specification  |
| CK\_1A\_U15 | understands the need and is able to learn alone |
| Social competences |
| CK\_1A\_K01 | is aware of his/her knowledge and skills. Understands the need of learning and knows the possibilities of life-long learning and development. Determines the directions of his/her own development and education (studies of the second and third cycle, post-diploma studies, courses) |
| CK\_1A\_K02 | has the awareness of the importance of behaving in a professional manner, complying with the rules of professional ethics and respecting the variety of believes |
| CK\_1A\_K03 | is aware of the responsibility for his/her own work and the readiness to comply with the principles of teamwork and incur responsibility for joint accomplishment of a task |
| CK\_1A\_K04 | is aware of the risk and is able to evaluate the environmental effects of the activity performed within the scope of operation of refrigeration and air conditioning systems |
| CK\_1A\_K05 | is aware of the social role of a university graduate and, in particular, understands the need to popularise the knowledge gained |
| CK\_1A\_K06 | is able to think and act in an enterprising manner |
| CK\_1A\_K07 | is able to specify properly the priorities used for accomplishment of a task set alone or by others |

1. uchwała nr 2 Senatu ZUT z dnia 25 stycznia 2016 r. w sprawie określenia opisu efektów kształcenia dla kierunku studiów kynologia pierwszego stopnia prowadzonego na Wydziale Biotechnologii i Hodowli Zwierząt ZUT [↑](#footnote-ref-1)
2. uchwała nr 44 Senatu ZUT z dnia 13 czerwca 2016 r. w sprawie określenia opisu efektów kształcenia dla kierunku studiów projektowanie architektury wnętrz i otoczenia pierwszego stopnia prowadzonego na Wydziale Budownictwa i Architektury ZUT [↑](#footnote-ref-2)
3. uchwała nr 85 Senatu ZUT z dnia 30 listopada 2015 r. w sprawie określenia opisu efektów kształcenia dla kierunku studiów energetyka drugiego stopnia prowadzonego na Wydziale Inżynierii Mechanicznej i Mechatroniki ZUT [↑](#footnote-ref-3)
4. uchwała nr 15 Senatu ZUT z dnia 27 marca 2017 r. w sprawie określenia opisu efektów kształcenia dla kierunku studiów **uprawa winorośli i winiarstwo**pierwszego stopniaprowadzonego na Wydziale Kształtowania Środowiska i Rolnictwa ZUT [↑](#footnote-ref-4)
5. uchwała nr 76 Senatu ZUT z dnia 27 października 2014 r. w sprawie określenia opisu efektów kształcenia dla kierunku studiów **mikrobiologia stosowana** drugiego stopnia prowadzonego na Wydziale Nauk o Żywności i Rybactwa ZUT [↑](#footnote-ref-5)
6. uchwała nr 74 Senatu ZUT z dnia 27 października 2014 r. w sprawie określenia opisu efektów kształcenia dla kierunku studiów **chłodnictwo i klimatyzacja** pierwszego stopnia prowadzonego na Wydziale Techniki Morskiej i Transportu ZUT [↑](#footnote-ref-6)