



**SZKOŁA GŁÓWNA  
GOSPODARSTWA  
WIEJSKIEGO**

## **Study programme**

# **Food Science - Technology and Nutrition**

<b>Faculty:</b>	Faculty of Food Technology
<b>Level of study:</b>	first cycle (bachelor's degree)
<b>Education profile:</b>	General academic
<b>Form of study:</b>	full-time studies
<b>Academic year:</b>	2023/24

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## Basic information

Faculty name:	Faculty of Food Technology
Major name:	Food Science - Technology and Nutrition
Level of study:	first cycle (bachelor's degree)
Profile of study:	General academic
Form of study:	full-time studies
Duration of studies (number of semesters):	6
Number of ECTS required to complete the studies:	180
The number of ECTS points a student obtains during classes conducted with the direct participation of academic teachers or other persons conducting classes:	100
Professional title awarded to graduates:	licencjat
ISCED code:	0721
Language of study:	english

### Assigning the major to the fields and disciplines to which the learning outcomes relate

Food technology and nutrition	100%
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## **Major characteristics**

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The Food Science – Technology and Nutrition (FSTN) study programme offers students a modern teaching in the field of food technology and human nutrition based on the latest scientific achievements. The assumed learning outcomes are achieved using contemporary techniques, resources and research infrastructure, and with the huge support of highly experienced academics of the Institute of Food Sciences and the Institute of Human Nutrition Sciences (WULS-SGGW), therefore the FSTN study programme provides an attractive and interdisciplinary offer to everyone who is interested in acquiring the knowledge, competences and skills in the field of food technology and human nutrition.

The Food Science – Technology and Nutrition study programme offers the students a large number of contact hours, including lectures, practical laboratory activities (such as, performing experiments in groups or individually), as well as project-based activities. In addition to knowledge related to technological processes and the impact of food and nutrition on human health, the graduates will be able to identify chemical, biological and physical hazards during food production, processing, distribution and storage. The proposed study offer focuses also on the organization of technological processes, especially on the high-quality products and the implementation of processes with the use of the most modern and innovative techniques, standards and sustainable food systems, as well as allows to acquire knowledge and skills regarding the impact of food and nutrition on restoring and maintaining the health.

### **Learning objectives**

The studies is aimed to provide the students the most up-to-date knowledge, as well as developing skills and competences in the field of food technology, food processing and human nutrition. The aim of the FSTN studies is also to prepare the graduate for further professional development, to carry on scientific research, and to enable the graduate to continue the education at the second-degree studies. The university mission is based on intellectual and social development of Polish and international society. This is implemented e.g. by distinguishing it as an attractive, friendly, safe and prejudice-free place to study, as well as equipping graduates with qualifications highly valued by enterprises and public and social institutions.

### **Education concept**

The concept of the education in the field of study assumes that students have the opportunity to acquire knowledge and skills in the field of the organization of the production processes, basics economics, and marketing in a food industry enterprise and mass catering establishments, as well as the basics of production management. They also understand the rules of the food market and the essence of food marketing and consumer behavior, as well as they acquire the knowledge about the nutrition-related aspects of health.

### **Description of work placement (if provided for in the study programme)**

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### **Graduate profile**

Graduates have knowledge in the field of food technology and nutritional sciences, with particular emphasis on the processing, preservation, and storage of food of plant and animal origin, food biotechnology, food analysis, and evaluation of food quality, food engineering, and the impact of the production processes on the nutritional, dietary and health aspects of food products. The graduates of first-cycle can work in various food processing companies, in research or research and development institutes, in laboratories, institution branches of the food industry, in food distribution units, in catering, in disseminating knowledge institutions, in consulting and auditing companies, and in other institutions of the food chain.

## Learning outcomes

### Knowledge

Code	Content	PRK
<b>TN_K1_W01</b>	The graduate knows and understands theoretical issues in the field of biological, chemical, mathematical, and related sciences, which are the basis for the description of phenomena occurring in food and the human being body, used for its description	P6S_WG
<b>TN_K1_W02</b>	The graduate knows and understands processes and phenomena occurring in the human being body in the nutrition process and the influence of food ingredients on the human being body and functions, importance and influence of food ingredients and energy value on the development and functioning of the human being body and their importance in ensuring public health	P6S_WG
<b>TN_K1_W03</b>	The graduate knows and understands the composition and properties of raw materials, auxiliaries, food additives, and food industry products, the possibilities and conditions of use of them in food production, taking into account the principles of sustainable development and their impact on human health	P6S_WG
<b>TN_K1_W04</b>	The graduate knows and understands the theoretical basis of phenomenon and changes occurring in raw materials, semi-finished products, and food products in a natural way, and under the influence of technological processes, food storage and testing	P6S_WG
<b>TN_K1_W05</b>	The graduate knows and understands basics of construction and operation of machines, devices, and instruments used for food processing and testing	P6S_WG
<b>TN_K1_W06</b>	The graduate knows and understands methods and techniques used for food processing, preservation, storage, and testing	P6S_WG
<b>TN_K1_W07</b>	The graduate knows and understands principles of good production and hygiene practice as well as systems and standards related to quality and safety assurance of food	P6S_WG
<b>TN_K1_W08</b>	The graduate knows and understands rules and organization methods of the production and chain of food supply (planning, production organization, storage, distribution of food and food consumption in collective and individual nutrition) in accordance with the legal requirements of assurance of quality and food safety and the principles of sustainable development	P6S_WG
<b>TN_K1_W09</b>	The graduate knows and understands factors determining the quality and health safety of food with a different degree of processing, health hazards related to food, and methods of reducing the risk associated with these hazards	P6S_WG
<b>TN_K1_W10</b>	The graduate knows and understands rules for assessing the diet, nutritional quality and health of individuals and population as well as cultural and social aspects of food production, distribution and consumption, food quality design, including intangible aspects of food, and its socio-cultural functions	P6S_WG
<b>TN_K1_W11</b>	The graduate knows and understands economic, social, environmental, ethical, and legal conditions of food production and the principles of development of new products, distribution, and offering food to consumers, including basic concepts and principles in the field of protection of industrial property and copyright	P6S_WK
<b>TN_K1_W12</b>	The graduate knows and understands foundations for the creation of enterprises operating in the area of the food economy and the way of management of these enterprises, determining the effectiveness of their activity	P6S_WK

## Skills

Code	Content	PRK
TN_K1_U01	The graduate can conduct experiments and solve practical issues in the field of basic sciences, and then implement them in activities carried out under directional issues in the field of food processing and human nutrition	P6S_UW
TN_K1_U02	The graduate can assess the composition, energy and nutritional value of food products, determine their impact on the growth, development, functioning and health of the body, assess the diet, and nutritional status, and use the obtained results to rationalize the nutrition of individuals and different population groups	P6S_UW
TN_K1_U03	The graduate can select methods and tools to make observations, measurements, and calculations in the field of phenomena occurring during processing, storage, research of food, human nutrition and consumer behaviour on the food market, and critically analyze and interpret the obtained data, assess the credibility of own actions	P6S_UW
TN_K1_U04	The graduate can analyze and evaluate the existing solutions appropriate for the food economy, identify problems and opportunities for professional activity, search for new solutions, and ways of their implementation using modern tools, including experiments, analytical methods, computer simulations, information and communication techniques, and others	P6S_UW
TN_K1_U05	The graduate can carry out activities in the field of the technological and functional design of food production and mass catering plants, taking into account the marketing strategy and in accordance with the applicable standards of good manufacturing and hygienic practice as well as food quality and safety systems	P6S_UW
TN_K1_U06	The graduate can obtain, analyze and synthesize the obtained information and draw conclusions taking into account various conditions related to the aspects of human nutrition, food production, including regional production, food evaluation, consumer protection, intellectual property protection, legal, technological, economic, social, and sociological, cultural, ecological and ethical aspects of food production and consumption as well as quality and safety assurance in the food chain and human nutrition	P6S_UW
TN_K1_U07	The graduate can communicate with the surrounding using specialist terminology appropriate for the field of study, including taking part in a discussion on professional issues, also using a foreign language in the field relevant to the field of study, in accordance with the requirements set out for B2 level of the European System for the Description of Education Linguistic	P6S_UK
TN_K1_U08	The graduate can plan, organize and carry out, independently or in a team, simple project tasks related to food production and evaluation, human nutrition, and consumer behaviour	P6S_UO
TN_K1_U09	The graduate can update knowledge and deepen practical skills in the field of study, taking into account the progress in the development of science and technology, and the need for specific competences in the food production and human nutrition sector	P6S_UU

## Social competence

Code	Content	PRK
TN_K1_K01	The graduate is ready to contact and exchange of experiences and knowledge with the experts in order to explore better solutions for particular problems connected to among others: food production, delivery chain, food storage and human nutrition	P6S_KK

<b>Code</b>	<b>Content</b>	<b>PRK</b>
<b>TN_K1_K02</b>	The graduate is ready to complete professional duties in a socially responsible manner, enterprising, ethical, compatible with the public interest and also with the respect for professional tradition, and for the right to intellectual property protection	P6S_KO
<b>TN_K1_K03</b>	The graduate is ready to take responsibility for the high quality and high pro-health value food production, meeting the quality standards and health safety requirements	P6S_KO
<b>TN_K1_K04</b>	The graduate is ready to responsible performing of professional roles, in it: compliance with the professional ethics and exploring knowledge related to the profession	P6S_KR

## Study plan

### Semester 1

In semester 1, students complete library training and a health and safety course on a platform available at <https://szkolenia.sggw.pl>

Subject	Number of hours	ECTS points	Form of verification
OHS training	OHS training: 4	0	Pass O
Biology	Lecture: 30 Laboratory exercises: 15	4	Pass with grade O
Mathematics	Lecture: 15 Auditorium exercises: 30	4	Pass with grade O
General and organic chemistry	Lecture: 30 Laboratory exercises: 30	4	Pass with grade O
Sustainable food systems	Lecture: 15 Auditorium exercises: 30	3	Pass with grade O
Information Technology	Lecture: 15 Laboratory exercises: 45	4	Pass with grade O
Food raw materials	Lecture: 15 Laboratory exercises: 30	4	Pass with grade O
Foreign language 1	Language course: 60	3	Pass with grade G
Student chooses foreign language classes			
Polish	Language course: 60	3	Pass with grade F
English	Language course: 60	3	Pass with grade F
Spanish	Language course: 60	3	Pass with grade F
German	Language course: 60	3	Pass with grade F
Russian	Language course: 60	3	Pass with grade F
Humanities electives	Contact hours: 45	4	Pass with grade G
Student chooses classes from an open list			
Nutrition sociology	Lecture: 15 Auditorium exercises: 30	4	Pass with grade F
Polish culture	Lecture: 15 Auditorium exercises: 30	4	Pass with grade F
<b>Sum</b>	<b>409</b>	<b>30</b>	

### Semester 2

Subject	Number of hours	ECTS points	Form of verification
Food chemistry	Lecture: 30 Laboratory exercises: 30	5	Exam O



<b>Subject</b>	<b>Number of hours</b>	<b>ECTS points</b>	<b>Form of verification</b>	
General and food microbiology	Lecture: 30 Laboratory exercises: 30	5	Exam	O
Introduction to food processing	Lecture: 15 Auditorium exercises: 40	5	Pass with grade	O
Introduction to human nutrition	Lecture: 20 Laboratory exercises: 30	4	Pass with grade	O
Basic statistics	Lecture: 15 Laboratory exercises: 30	3	Pass with grade	O
Engineering Graphics	Lecture: 15 Laboratory exercises: 45	4	Pass with grade	O
Foreign language 2	Language course: 60	3	Pass with grade	G
Students complete classes in a foreign language chosen in semester 1.				
Polish	Language course: 60	3	Pass with grade	F
English	Language course: 60	3	Pass with grade	F
Spanish	Language course: 60	3	Pass with grade	F
German	Language course: 60	3	Pass with grade	F
Russian	Language course: 60	3	Pass with grade	F
Confirmation B2 foreign language	Contact hours: 2	1	Exam	O
Physical education	Physical education: 30	0	Pass	O
<b>Sum</b>	<b>422</b>	<b>30</b>		

## Semester 3

<b>Subject</b>	<b>Number of hours</b>	<b>ECTS points</b>	<b>Form of verification</b>	
Biochemistry & enzymology	Lecture: 30 Laboratory exercises: 30	4	Exam	O
Basics of human anatomy and physiology	Lecture: 30 Laboratory exercises: 30	5	Exam	O
General food technology	Lecture: 30 Laboratory exercises: 45	5	Exam	O
Plant-origin food technology	Lecture: 15 Laboratory exercises: 30	4	Pass with grade	O
Food production equipment	Lecture: 15 Laboratory exercises: 30	4	Pass with grade	O
Basics of food engineering	Lecture: 15 Laboratory exercises: 30	4	Exam	O
Instrumental methods of food analysis	Lecture: 15 Laboratory exercises: 45	4	Pass with grade	O
Physical education	Physical education: 30	0	Pass	O
<b>Sum</b>	<b>420</b>	<b>30</b>		

## Semester 4

Subject	Number of hours	ECTS points	Form of verification
Advanced human nutrition	Lecture: 15 Laboratory exercises: 45	5	Pass with grade O
Animal-origin food technology	Lecture: 15 Laboratory exercises: 30	3	Pass with grade O
Food biotechnology	Lecture: 30 Laboratory exercises: 30	5	Exam O
Pathogens in water and food	Lecture: 15 Laboratory exercises: 30	4	Pass with grade O
New food products development	Lecture: 30 Laboratory exercises: 15	4	Pass with grade O
Food additives and contaminants	Lecture: 25	1	Exam O
Sensory analysis	Lecture: 15 Laboratory exercises: 30	4	Pass with grade O
Consumer behaviour	Lecture: 15 Project exercises: 30	4	Pass with grade O
<b>Sum</b>	<b>370</b>	<b>30</b>	

## Semester 5

Subject	Number of hours	ECTS points	Form of verification
Food production hygiene	Lecture: 15 Laboratory exercises: 30	3	Pass with grade O
Catering technology	Lecture: 15 Laboratory exercises: 30	3	Pass with grade O
Food packaging and contact materials	Lecture: 15 Laboratory exercises: 30	3	Pass with grade O
Basics of dietetics	Lecture: 15 Laboratory exercises: 30	3	Pass with grade O
Nutrition of selected population groups	Lecture: 15 Laboratory exercises: 30	3	Pass with grade O
Electives 1	Contact hours: 225	15	Pass with grade G
Student chooses five classes from an open list			
Alcoholic beverages and human being	Lecture: 30 Auditorium exercises: 15	3	Pass with grade F

<b>Subject</b>	<b>Number of hours</b>	<b>ECTS points</b>	<b>Form of verification</b>
Contemporary methods of management	Lecture: 30 Auditorium exercises: 15	3	Pass with grade F
Drugs, medicines and smart food components and additives	Lecture: 30 Auditorium exercises: 15	3	Pass with grade F
Functional food	Lecture: 30 Auditorium exercises: 15	3	Pass with grade F
Dietary prevention	Lecture: 30 Auditorium exercises: 15	3	Pass with grade F
Trends in food and consumption	Lecture: 30 Auditorium exercises: 15	3	Pass with grade F
Alternative diets	Lecture: 30 Auditorium exercises: 15	3	Pass with grade F
Environment, diet and health	Lecture: 30 Auditorium exercises: 15	3	Pass with grade F
<b>Sum</b>	<b>450</b>	<b>30</b>	

## Semester 6

<b>Subject</b>	<b>Number of hours</b>	<b>ECTS points</b>	<b>Form of verification</b>
Protection of intellectual property	Lecture: 15	1	Exam O
Technological design electives	Lecture: 15 Project exercises: 45	4	Pass with grade G
Students chooses one subject			
Technological design of food industry plants	Lecture: 15 Project exercises: 45	4	Pass with grade F
Technological design of food gastronomy plants	Lecture: 15 Project exercises: 45	4	Pass with grade F
Methodological electives	Auditorium exercises: 30	2	Pass with grade G
Students chooses one subject			
Methodology in technological projects	Auditorium exercises: 30	2	Pass with grade F
Methodology in nutritional projects	Auditorium exercises: 30	2	Pass with grade F
Food safety and quality management electives	Lecture: 15	1	Pass with grade G
Students chooses one subject			

<b>Subject</b>	<b>Number of hours</b>	<b>ECTS points</b>	<b>Form of verification</b>
Food safety and quality management in food production	Lecture: 15	1	Pass with grade F
Food safety and quality management in gastronomy	Lecture: 15	1	Pass with grade F
Project electives	Project exercises: 60	5	Pass with grade G
Students chooses one subject			
Technological projects	Project exercises: 60	5	Pass with grade F
Nutritional project	Project exercises: 60	5	Pass with grade F
Seminar	Project exercises: 30	2	Pass with grade G
Students chooses one subject			
Seminar (food technology)	Project exercises: 30	2	Pass with grade F
Seminar (human nutrition)	Project exercises: 30	2	Pass with grade F
Electives 2	Contact hours: 225	15	Pass with grade G
Student chooses five classes from an open list			
Bioengineering in food industry	Lecture: 30 Laboratory exercises: 15	3	Pass with grade F
Cutting-edge technologies in food industry	Lecture: 30 Laboratory exercises: 15	3	Pass with grade F
Design thinking in food industry	Lecture: 30 Project exercises: 15	3	Pass with grade F
Drying	Lecture: 30 Laboratory exercises: 15	3	Pass with grade F
Herbs, food and health	Lecture: 30 Laboratory exercises: 15	3	Pass with grade F
Physical properties of food	Lecture: 30 Laboratory exercises: 15	3	Pass with grade F
Prevention of food quality	Lecture: 30 Laboratory exercises: 15	3	Pass with grade F
Public health nutrition	Lecture: 30 Auditorium exercises: 15	3	Pass with grade F
<b>Sum</b>	<b>435</b>	<b>30</b>	

*O - Obligatory subjects*  
*G - Mandatory group*  
*F - Elective subjects*

## **Description of the learning outcomes assigned to the subjects and the curriculum content ensuring the achievement of these outcomes**

Subject name:		Biology	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	theoretical issues regarding biological sciences as a basis for the description of the structure and functions of the human body in various stages of ontogenesis and in various health conditions	TN_K1_W01
	W2	selected processes in the human organism as a result of the interaction between food ingredients and genetic material in the cells and their significance for the normal functioning of the organism and health	TN_K1_W02
	W3	biological conditions for the use of selected raw materials of animal origin in the production of high pro-health quality foods	TN_K1_W03
Skills: (In terms of skills, the graduate can)	U1	evaluate the suitability of selected animal organisms as a source of food for humans	TN_K1_U02
	U2	communicate using terminology related to biological issues	TN_K1_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	fulfill the professional roles responsibly and to broaden his or her knowledge related to biological issues	TN_K1_K04
Course content ensuring the achievement of learning outcomes:		Selected biological issues in relation to the structure and functioning of animal organisms at the molecular, cellular, tissue and individual levels at various stages of ontogenesis and the possibility of their use in the production of high pro-health quality foods and in human nutrition. The subject is useful in studying subjects in the areas of biochemistry as well as human anatomy, physiology and nutrition.	
Examination methods:		Written credit, Report, Presentation, Test (written or computer based)	

Subject name:		Mathematics	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the basic definitions, properties, criteria and theorems concerning elementary functions, sequence limit, number series as well as function limit and continuity, as well as the basic definitions, properties, theorems and interpretations of differential and integral calculus; the graduate also knows and understands the basic definitions, properties and theorems concerning matrices, determinants and systems of linear equations	TN_K1_W01
Skills: (In terms of skills, the graduate can)	U1	study the properties of simple elementary functions, calculate the limits of simple sequences, investigate the convergence of simple series, calculate the limits and study the continuity of simple functions, is able to calculate the derivatives of simple functions, study their properties with the help of derivatives, calculate simple indefinite, marked and incorrect integrals, calculate the areas and mean values of functions with the help of integrals, is able to perform arithmetic operations on matrices, calculate determinants and orders of matrices and solve systems of linear equations in simple cases	TN_K1_U01
Social competences: (Within the scope of competence, the graduate is ready to)	K1	use the models and accounting techniques learned in the course in simple practical problems related to major subjects	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of knowledge, competencies, and skills in the field of Mathematics with particular emphasis the issues on matrices, numerical sets, general properties of functions, sequences, numerical series, limit and derivative of functions of one variable, indefinite integral, definite and improper integral, ordinary differential equations.	
Examination methods:		Written credit, Assessment of activity during classes	

Subject name:		General and organic chemistry	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	appropriate knowledge of inorganic and organic chemistry adjusted to study Food Science: Technology and Nutrition	TN_K1_W01
	U1	write chemical equations taking place in water solutions, can calculate percent and molar concentration, is able to isolate and purify organic compounds, is able to synthesize an organic compound using an appropriate procedure.	TN_K1_U01
	U2	performs quantitative chemical analysis (such as titration, pH evaluation) using different analytical methods, carries out laboratory work necessary for doing simple experiments, can work both individually or as a part of a team, interprets the results of chemical experiments, communicates with others using English language at B2 level.	TN_K1_U01, TN_K1_U07
	K1	fulfill professional duties, is aware of major threats related to the work with chemical reagents, takes care about his own and others' safety	TN_K1_K02, TN_K1_K03
Course content ensuring the achievement of learning outcomes:		The recollection and systematization of knowledge comprising the fundamentals of inorganic and organic chemistry within the scope necessary to study further. Students should know how to perform basic quantitative analysis, isolation and purification of organic compounds. Students should be able to do basic chemical calculations (concentration, pH, reaction yield), interpret the results of the experiments and prepare a report.	
Examination methods:		Test (written or computer based), Assessment of work in the laboratory	



Subject name:		Sustainable food systems	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	food production taking into account the principles of sustainable development and its impact on human health and the natural environment.	TN_K1_W03
	W2	principles and methods of organizing food production and the food value chain in line with the Sustainable Development Goals.	TN_K1_W08
Skills: (In terms of skills, the graduate can)	U1	obtain, analyze and synthesize information and draw conclusions taking into account various conditions related to the aspects of food production, including regional production, ecological aspects of food production and consumption, and ensuring quality and safety in the food chain and human nutrition.	TN_K1_U06
	U2	plan, organize and execute, individually or in a team, simple project tasks related to selected aspects of sustainable food systems.	TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	contact and exchange experiences and knowledge with experts in order to search for the best solutions to specific problems related to the sustainability of food systems.	TN_K1_K01
	K2	take responsibility for the production of high-quality, health-promoting food, in accordance with the Sustainable Development Goals.	TN_K1_K03
Course content ensuring the achievement of learning outcomes:		The program contents include the basics and various aspects of sustainable food systems, including sustainable food production, processing and consumption.	
Examination methods:		Written credit, Project	

Subject name:		Information Technology	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	terminology related to the use of computers, the operating system, various applications, including office suites and others used in professional work and private life	TN_K1_W01
	W2	functionalities of editors to achieve professional text properties	TN_K1_W01
	W3	digital techniques used for the purposes of collecting and basic data analysis and presentation	TN_K1_W12
	U1	built-in spreadsheet functions to automate calculation and reporting activities	TN_K1_U03, TN_K1_U04
	U2	functionalities of editors to achieve professional text properties	TN_K1_U01, TN_K1_U07
	K1	cooperate with other people in order to carry out the assigned tasks, also with the use of distance learning methods	TN_K1_K01
	K2	consciously use modern software along with its updating, at the same time prepared for the consequences associated with its improper use	TN_K1_K02
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of the knowledge, competencies, and skills in the field of information technology with emphasis the issues on formatting the layout of a multi-page document - styles, references and automatic lists, document review, mail merge, form creation and limiting document editing, application of formulas and basic functions built into the worksheet, charts and graphic elements. Students should be able to use of advanced built-in functions: logical functions, date and time, designing and building / creating a database, relations between tables, forms, and data mining with the use of queries, as well as reporting and database management. Students should also be able to present the content/data/results (measurements, tests and analyzes) in an attractive way for the recipient, using a multimedia presentation.	
Examination methods:		Test (written or computer based), Assessment of work in the laboratory	

Subject name:		Food raw materials	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the issues regarding on food raw materials, including the knowledge on the impact of production, storage and distribution conditions on the quality and usability of plant and animal raw materials	TN_K1_W03
	W2	the importance of the energy value, nutrients and bioactive compounds contained in food raw materials for the functioning of the human organism	TN_K1_W04
Skills: (In terms of skills, the graduate can)	U1	acquire, process and analyze information from various sources, including various aspects of the impact of production on the quality of food raw materials	TN_K1_U01
	U2	analyze and interpret a scientific and technical text and experimental facts in a language appropriate for a given discipline of knowledge	TN_K1_U01
Social competences: (Within the scope of competence, the graduate is ready to)	K1	critically assess the effects of engineering activities in the production of food raw materials	TN_K1_K03
	K2	take responsibility for the production of high-quality, pro-health food raw materials	TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of knowledge, competences and skills in the field of food raw materials of plant and animal origin, in particular the aspects regarding on the origin, systematics, commodity aspects, pro-healthy properties of vegetables, fruit and unprocessed animal raw materials.	
Examination methods:		Written credit	

Subject name:		Polish	ECTS: 6
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Skills: (In terms of skills, the graduate can)	U1	communicate on the elementary level in spoken and written forms.	TN_K1_U07
	U2	describe everyday phenomena.	TN_K1_U07
	U3	express opinions, give reasons or make plans.	TN_K1_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	work in a team.	TN_K1_K01, TN_K1_K02
	K2	communicate in different situations of everyday life.	TN_K1_K01, TN_K1_K02
Course content ensuring the achievement of learning outcomes:		Vocabulary connected with family, everyday life, housing, transport, work, education, nutrition, services, health, sport and natural environment. Grammar structures: correct use of word forms and sentence structures, word formation. Language functions: practising communication, pronunciation and spelling.	
Examination methods:		Written credit, Essay, Assessment of activity during classes	

Subject name:		English	ECTS: 6
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Skills: (In terms of skills, the graduate can)	U1	describe phenomena, processes, procedures.	TN_K1_U07
	U2	conduct correspondence and take notes.	TN_K1_U07
	U3	give explanations, give reasons, express opinions or make plans.	TN_K1_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	prepare and deliver presentations.	TN_K1_K01, TN_K1_K02
	K2	work in a team and conduct a discussion.	TN_K1_K01, TN_K1_K02
	K3	communicate correctly in most situations of everyday life and professional life without preparation.	TN_K1_K01, TN_K1_K02
Course content ensuring the achievement of learning outcomes:		Vocabulary connected with education, work, science, health, culture and entertainment, sport, technology, information exchange and environment. Grammar structures: correct use of word forms and sentence structures, word formation. Language functions: practising communication, pronunciation and spelling.	
Examination methods:		Written credit, Essay, Assessment of activity during classes	

Subject name:		Spanish	ECTS: 6
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Skills: (In terms of skills, the graduate can)	U1	describe phenomena, processes, procedures.	TN_K1_U07
	U2	conduct correspondence and take notes.	TN_K1_U07
	U3	give explanations, give reasons, express opinions or make plans.	TN_K1_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	prepare and deliver presentations.	TN_K1_K01, TN_K1_K02
	K2	work in a team and conduct a discussion.	TN_K1_K01, TN_K1_K02
	K3	communicate correctly in most situations of everyday life and professional life without preparation.	TN_K1_K01, TN_K1_K02
Course content ensuring the achievement of learning outcomes:		Vocabulary connected with education, work, science, health, culture and entertainment, sport, technology, information exchange and environment. Grammar structures: correct use of word forms and sentence structures, word formation. Language functions: practising communication, pronunciation and spelling.	
Examination methods:		Written credit, Essay, Assessment of activity during classes	

Subject name:		German	ECTS: 6
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Skills: (In terms of skills, the graduate can)	U1	describe phenomena, processes, procedures.	TN_K1_U07
	U2	conduct correspondence and take notes.	TN_K1_U07
	U3	give explanations, give reasons, express opinions or make plans.	TN_K1_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	prepare and deliver presentations.	TN_K1_K01, TN_K1_K02
	K2	work in a team and conduct a discussion.	TN_K1_K01, TN_K1_K02
	K3	communicate correctly in most situations of everyday life and professional life without preparation.	TN_K1_K01, TN_K1_K02
Course content ensuring the achievement of learning outcomes:		Vocabulary connected with education, work, science, health, culture and entertainment, sport, technology, information exchange and environment. Grammar structures: correct use of word forms and sentence structures, word formation. Language functions: practising communication, pronunciation and spelling.	
Examination methods:		Written credit, Essay, Assessment of activity during classes	

Subject name:		Russian	ECTS: 6
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Skills: (In terms of skills, the graduate can)	U1	describe phenomena, processes, procedures.	TN_K1_U07
	U2	conduct correspondence and take notes.	TN_K1_U07
	U3	give explanations, give reasons, express opinions or make plans.	TN_K1_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	prepare and deliver presentations.	TN_K1_K01, TN_K1_K02
	K2	work in a team and conduct a discussion.	TN_K1_K01, TN_K1_K02
	K3	communicate correctly in most situations of everyday life and professional life without preparation.	TN_K1_K01, TN_K1_K02
Course content ensuring the achievement of learning outcomes:		Vocabulary connected with education, work, science, health, culture and entertainment, sport, technology, information exchange and environment. Grammar structures: correct use of word forms and sentence structures, word formation. Language functions: practising communication, pronunciation and spelling.	
Examination methods:		Written credit, Essay, Assessment of activity during classes	



Subject name:		Nutrition sociology	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	links between culture, social structure, social change, and food consumption	TN_K1_W10
	W2	socio-cultural determinants of eating behavior	TN_K1_W11
Skills: (In terms of skills, the graduate can)	U1	obtain, analyze, synthesize information, and draw conclusions with respect to various socio-cultural determinants	TN_K1_U06
	U2	prepare and give a presentation on selected issues in the field of socio-cultural determinants of eating behavior	TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	perform their professional responsibilities in a socially responsible, entrepreneurial, and ethical manner	TN_K1_K02
	K2	cooperate in a group and take on different roles within it	TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of knowledge, competencies, and skills in the field of social aspects related to food and nutrition.	
Examination methods:		Written credit, Essay, Presentation	

Subject name:		Polish culture	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the specificity of Polish culture, including the cultural and social aspects of food production, distribution and consumption, including the intangible aspects of food and its socio-cultural functions	TN_K1_W10
	W2	economic, social, environmental and ethical conditions of food production and the principles of new product development, distribution and offering food to consumers in Poland	TN_K1_W11
Skills: (In terms of skills, the graduate can)	U1	acquire, analyze and synthesize the obtained information and draw conclusions taking into account various conditions related to the aspects of human nutrition, food production, including regional production, social, cultural, ecological and ethical aspects of food production and consumption	TN_K1_U06
	U2	plan, organize and carry out, alone or in a team, simple design tasks related to human nutrition and consumer behavior	TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	perform their professional duties in a socially responsible, entrepreneurial, ethical manner, consistent with the public interest	TN_K1_K02
	K2	responsible performance of professional roles, including observance of professional ethics and expanding knowledge related to the performed profession	TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of knowledge, competencies, and skills in the field of Polish culture with emphasis on the specificity of Polish culture in comparison with European cultures. Selected events in the history of Poland, Polish economy from a diachronic perspective, the specificity of the Polish language and Polish names of food, cultural conditions of domestic and industrial food production, regional diversity of Polish culture, intangible aspects of food in Polish culture, socio-cultural functions of food in Polish culture, Polish holidays and rituals of passage and festive consumption, internal diversity of Polish society and its influence on consumer behavior, development and change in Polish society and culture.	
Examination methods:		Test (written or computer based), Project, Presentation	

Subject name:		Food chemistry	ECTS: 5
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the structure, properties and importance of food ingredients	TN_K1_W01, TN_K1_W03
	W2	the chemical and enzymatic transformations in food and the harmful substances that are formed in food during storage and processing	TN_K1_W04, TN_K1_W09
	W3	the methods and techniques of chemical analysis useful in determining the composition, structure of food ingredients and in assessing and forming of food safety and quality	TN_K1_W05, TN_K1_W06
Skills: (In terms of skills, the graduate can)	U1	interpret the obtained empirical data on the structure and properties of food ingredients	TN_K1_U01, TN_K1_U06
	U2	work in a team when planning and carrying out experiments in the field of food chemistry	TN_K1_U07, TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	exchange experiences and knowledge with experts in order to search for solutions to problems related to, inter alia, with the structure, properties and meaning of food ingredients; chemical and enzymatic transformations in food as well as methods and techniques of chemical analysis useful in food research	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		Structure, properties, changes and chemical and enzymatic modifications of food ingredients, with particular emphasis on the processes affecting its safety, quality and nutritional value. Knowledge about the interactions of individual ingredients during food processing and storage.	
Examination methods:		Written exam, Report, Test (written or computer based)	

Subject name:		General and food microbiology	ECTS: 5
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the similarities and differences among microorganisms (bacteria, fungi, viruses, their physiology, reproduction, elements of molecular biology, nutrition and growth) and their role in food quality (spoilaging, pathogenic microflora, biotechnological usage)	TN_K1_W01, TN_K1_W03, TN_K1_W09
Skills: (In terms of skills, the graduate can)	U1	use proper methods in the assessment of isolation, identification and growth of microorganisms, microbiological quality of raw materials and various types of food	TN_K1_U01, TN_K1_U03, TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	team analysis of a defined experiment	TN_K1_K03
Course content ensuring the achievement of learning outcomes:		Characteristic groups of microorganisms causing contamination of raw materials and various types of food products, the influence of factors on the microbiological quality of food, characteristic of pathogens transmitted by food and the role of beneficial microorganisms in food fermentation.	
Examination methods:		Written exam, Written credit, Report	

Subject name:		Introduction to food processing	ECTS: 5
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the composition and properties of raw materials, auxiliaries, food additives and food industry products, the possibilities and conditions of their use in food production, taking into account the principles of sustainable development	TN_K1_W03
	W2	methods and techniques used in food processing, preservation, storage and testing	TN_K1_W06
Skills: (In terms of skills, the graduate can)	U1	obtain, analyze and synthesize the obtained information and draw conclusions taking into account various conditions related to the aspects of food production, including regional production, food evaluation, consumer protection, technological, economic, ecological and ethical aspects of food production and logistics, and ensuring quality and safety in the food chain	TN_K1_U06
Social competences: (Within the scope of competence, the graduate is ready to)	K1	contact and exchange of experiences and knowledge with experts in order to search for the best solutions to specific problems related to food production, supply chain, food storage	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		Presentation of raw material base for each branch of food industry; production possibilities of each branch of food industry; presentation of organizational structures of factories from each branch of food industry.	
Examination methods:		Test (written or computer based), Report	

Subject name:		Introduction to human nutrition	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the role of nutrients in the body, including the body's needs	TN_K1_W02
	W2	energy content and nutritional values of foods, the main sources of nutrients in the diet, and their effect on health	TN_K1_W02, TN_K1_W03
Skills: (In terms of skills, the graduate can)	U1	identify (on a basic level) nutritional problems - deficiencies and excessive intake of some nutrients in the diet and in the organism, and can assess the composition, energy and nutritional value of food products and diet in relation to nutritional recommendations	TN_K1_U02
	U2	plan and perform simple task in the field of human nutrition individually and in a team	TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	recognize the importance of knowledge related to human nutrition and health	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of knowledge, competencies, and skills in the field of human nutrition with emphasis on, among others, the aspects on role of macro- and micronutrients in the organism, utilization of macro- and micronutrients from diet, symptoms of nutrients deficiencies and excessive intake, nutritional recommendations in different world regions, main sources of nutrients in food rations, food tables as a source of information about the nutritional value of food, energy values of food products and energy expenditure, characteristics of selected nutrients in food and diet, planning a menu on an individual level.	
Examination methods:		Written credit	

Subject name:		Basic statistics	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	basic statistical methods (in the range necessary for elementary applications)	TN_K1_W01
Skills: (In terms of skills, the graduate can)	U1	use computational programs in analyzing natural phenomena and is able to demonstrate the skills of statistical analysis in relation to his biological knowledge, performing basic statistical analysis and presenting the resulting conclusions	TN_K1_U01
Social competences: (Within the scope of competence, the graduate is ready to)	K1	use and expand their knowledge based on statistical analysis	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of the knowledge, competencies, and skills in the field of statistics. The students should know the basics of statistics and will be familiarized with the main methods of analysing data from observation and experimental research. The students should be able to develop the skills to work independently and freely when describing, analysing and interpreting biological data, as well as they will be able to select statistical methods necessary for proper inference based on existing data set.	
Examination methods:		Test (written or computer based), Written credit, Assessment of activity during classes	

Subject name:		Engineering Graphics	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	principles used in technical drawing and distinguishes between the basic types of construction materials used in the construction of machines and devices for the food industry	TN_K1_W05
	U1	read technical drawing and apply the rules of technical drawing in practice	TN_K1_U05, TN_K1_U08
	U2	make sketches and diagrams of machines and devices using computer techniques	TN_K1_U05, TN_K1_U08
	K1	use the acquired knowledge and skills in technical drawing in fulfilling his professional duties with respect to professional traditions and intellectual property protection law	TN_K1_K02
Course content ensuring the achievement of learning outcomes:		Construction materials in the food industry - rules of their selection, consumption of construction materials, strength, corrosion in the food industry, anti-corrosion protection, introduction to design in AutoCAD, types of drawings, projection rules, sections, lines and their types, accuracy of machine elements, dimensioning, connections elements of machine parts, machine parts and assemblies, drive units.	
Examination methods:		Written credit, Project, Report, Test (written or computer based)	



Subject name:		Confirmation B2 foreign language	ECTS: 1
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Skills: (In terms of skills, the graduate can)	U1	Use a foreign language at the B2 level.	TN_K1_U07
Course content ensuring the achievement of learning outcomes:		Self-preparation for the foreign language at B2 level exam.	
Examination methods:		Written exam	

Subject name:		Physical education	ECTS: 0
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	how physical exercise affects the development and functioning of the body.	
	W2	the aspects of morphological, anatomical and physiological foundations of the functioning of the human body and the consequences and risks associated with lack of physical activity.	
	W3	how physical activity affects health at every stage of life.	
	W4	the relationship between effort and systematic work and the effect obtained.	
Skills: (In terms of skills, the graduate can)	U1	analyze the level of own physical fitness, correctly interpret and identify problems occurring during the performance of tasks and make the right decisions to solve them.	
	U2	prepare the body for the effort, control and assess the state of the body's efficiency, use the acquired movement habits in the correct performance of everyday motor activities.	
	U3	use various forms of physical activity taking into account the current state of health, physical capabilities and age.	
	U4	cooperate in a team with commitment and full responsibility in order to achieve a specific result.	
	U5	undertake tasks adequate to their own talents and abilities.	
Social competences: (Within the scope of competence, the graduate is ready to)	K1	control their own physical development at every stage, taking care of the body in health and illness.	
	K2	build social relationships and knows how to use it to achieve individual and team goals.	
	K3	take responsibility for the state of their own health and that of others, including their own family in the future.	
Course content ensuring the achievement of learning outcomes:		Familiarizing the student with safety rules in physical education classes. Provide the student with basic movements, movement and body function during the selected motor activity. Familiarizing the student with the rules and regulations in the selected sport discipline. Familiarizing the student with the organization and conduct of competitions as part of the selected physical activity.	
Examination methods:		Assessment of activity during classes	

Subject name:		Biochemistry & enzymology	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the structure and function of the organic components of the cell (proteins, lipids, carbohydrates, nucleic acids and vitamins) with particular emphasis on enzymatic proteins, as well as the process and functions of selected metabolic pathways, including metabolic interdependencies and metabolism regulation mechanisms	TN_K1_W01
	W2	rules of technological processes with the use of enzymes for food preservation and processing	TN_K1_W04
	W3	the enzymatic processes influencing the composition and properties of raw materials and food products	TN_K1_W01
Skills: (In terms of skills, the graduate can)	U1	conduct experiments and solve practical problems in the field of enzyme kinetics and their applications, and then implement them in activities in the field of food processing	TN_K1_U01
	U2	undertake activities related to the selection of materials, methods, techniques, tools and technologies in the field of the use of enzymatic processes in the food industry	TN_K1_U03
Social competences: (Within the scope of competence, the graduate is ready to)	K1	critically evaluate the effects of enzyme use in the food industry, and use objective sources of scientific information and critically evaluate them	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of knowledge, competences and skills in the field of biochemistry and enzymology. In particular, the students gain the knowledge on the possibility of using enzymes in the food industry in order to obtain the desired raw material changes, improve the quality of the final product, or optimize production costs.	
Examination methods:		Written credit, Report, Assessment of work in the laboratory	

Subject name:		Basics of human anatomy and physiology	ECTS: 5
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	the mechanisms governing the functioning of the human body and its systems and organs; understands the mutual functional relationships between organs and systems in the human body and the relationships between the structure of individual organs and their functions.	TN_K1_W01
	U1	study and evaluate the operation, efficiency and adaptive capacity of one's own organs and the systems they create	TN_K1_U01
	U2	interpret the results of basic tests: hematological, spirometric, hemodynamics, urine and glycemia tests, and the results of digestive fluids properties and digestive enzyme activity	TN_K1_U09
	K1	use the knowledge about the structure and function of organs and the systems they create to understand and solve the problems related to the functioning of the organism	TN_K1_K01
	K2	recognize the importance of knowledge in the field of human anatomy and physiology in shaping correct attitudes in the field of eating behaviors	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The course provides of knowledge, competences and skills in the field of human anatomy and physiology, in particular, with regard to the structure and functioning of organs and the systems they create, as well as the mutual functional connections between them, the assessment of the functioning, efficiency and adaptive capacity of organs and systems included in composition of the human body.	
Examination methods:		Written exam, Written credit, Report	

Subject name:		General food technology	ECTS: 5
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the basic characteristics and quality requirements of raw materials processed in the food industry	TN_K1_W03
	W2	the principles of operations and processes used in food technology and their impact on the quality of products	TN_K1_W04
	W3	the methods of food preservation	TN_K1_W06
Skills: (In terms of skills, the graduate can)	U1	apply basic operations and processes and choose the appropriate method of food preservation depending on the specificity of the raw material	TN_K1_U03
Social competences: (Within the scope of competence, the graduate is ready to)	K1	for the responsibility for the reliability of the conducted experiments, the obtained results, their interpretation and transfer to the society	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		Basic definitions in food technology; food balance; the main tasks of the food industry; characteristics of raw materials with the requirements for food processing; contamination of the raw material and its purifying, operations and processes used in food technology: mechanical, thermal, diffusion type, physicochemical, chemical, biotechnological; methods of food preservation: freezing and cooling, heating, addition of osmoactive substances, drying, unconventional methods; auxiliary materials and techniques: food additives, washing and packaging devices, packaging, storage, control of the production process.	
Examination methods:		Written exam, Report, Test (written or computer based)	

Subject name:		Plant-origin food technology	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the rules for the selection and organization of the use of fruit, vegetable and cereal raw materials, including the technological processes and their impact on the properties of products and knows the processing processes and their influence on the characteristics of products of plant origin.	TN_K1_W03, TN_K1_W12
Skills: (In terms of skills, the graduate can)	U1	ability to use knowledge when selecting methods, devices and tools as well as making observations, measurements and calculations in the field of phenomena occurring during the production, processing and testing of fruit and vegetable products, cereals, fat and food concentrates.	TN_K1_U03
Social competences: (Within the scope of competence, the graduate is ready to)	K1	critically assess problems in the fruit and vegetable, cereals, fat and food concentrate field of industry.	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		Technology of semi-finished products and fruit and vegetable products with various degrees of processing. Technology of milling, groats, baking and confectionery as well as pasta production. Technologies used in the processing of fats and food concentrates.	
Examination methods:		Written credit, Test (written or computer based)	

Subject name:		Food production equipment	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	the principles of action of equipment used for production, measurement, and detection in food processing	TN_K1_W05
	U1	measure, collect data and analyze it for critical evaluation of food processing equipment	TN_K1_U04, TN_K1_U08
	K1	make general selection of equipment for production of food considering its safety and high quality	TN_K1_K03
Course content ensuring the achievement of learning outcomes:		Students should know examples of the basic equipment applied in heat, mechanical and diffusion processes during processing and preservations of foods. Students should be able to do simple experiments with application of different equipment used in the production of food as well as perform measurements of crucial parameters and interpret results of the experiment as well as to prepare a report.	
Examination methods:		Test (written or computer based), Report	

Subject name:		Basics of food engineering	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	principles, applications and the impact on food quality of basic unit operations and processes in food technology	TN_K1_W06
	U1	to collect data, explain, compute, and evaluate the progress of basic unit operations, in particular in terms of their performance	TN_K1_U03, TN_K1_U08
	K1	critically discuss the effect of unit operations in relation to their impact on food quality and safety in a wide sense	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		Students should know how to describe the unit operations related to fluid flow, mechanical, heat- and mass-transfer based processes, with particular emphasis on solving problems. Students should be able to do basic engineering calculations of unit operation, interpret results of experiment and prepare a report.	
Examination methods:		Written exam, Report	



Subject name:		Instrumental methods of food analysis	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	theoretical basis, measurement principles, apparatus construction, possibilities of various instrumental techniques using in food analysis	TN_K1_W04, TN_K1_W05
	U1	plan the experiment yourself, make calculations based on the results of instrumental measurements, prepare a report describing the experience	TN_K1_U01, TN_K1_U03
	K1	exchange experiences with experts in the field enabling solutions to issue related to food analysis	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		Modern instrumental techniques used in food analysis: thermal methods (DSC, PDSC, DTA, TGA), UV-VIS and FTIR spectroscopy, chromatographic methods (GC, HPLC).	
Examination methods:		Test (written or computer based), Report	

Subject name:		Advanced human nutrition	ECTS: 5
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the determinants of human nutrition	TN_K1_W02
	W2	the methods of assessing the diet and nutritional status of individuals and population groups	TN_K1_W10
Skills: (In terms of skills, the graduate can)	U1	assess the consumption of total food and nutrients contained in it and interpret the obtained results in the context of the impact on human health	TN_K1_U01
	U2	assess the nutritional status of individuals and population groups using appropriate methods and reference values for their interpretation	TN_K1_U02
	U3	select methods and tools to make observations and measurements in the field of phenomena occurring during research in the field of human nutrition	TN_K1_U03, TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	critically assess the effects of nutritional excesses and deficiencies on human health	TN_K1_K01
	K2	follow professional ethics and expand knowledge in the field of human nutrition	TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of the knowledge, competencies, and skills in the field of human nutrition with emphasis on theoretical and practical knowledge in the advanced human nutrition science with elements of the methodology of nutrition assessment (anthropometric and biochemical). Students will be familiarized with the current reference values in human nutrition, the basics of nutritional education and bioassessment in nutritional research. The students should be able to develop the ability to select appropriate methods for the assessment of diet and nutritional status, nutritional education and research in the field of food bio-evaluation.	
Examination methods:		Test (written or computer based), Project, Report, Assessment of work in the laboratory	

Subject name:		Animal-origin food technology	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the technologies for obtaining, preserving and processing of meat raw materials and factors influencing the quality and safety of meat raw materials and products made of them.	TN_K1_W03, TN_K1_W09
	W2	the technologies for obtaining, preserving and processing of milk and factors influencing the quality and safety of milk and its products.	TN_K1_W03, TN_K1_W09
	W3	the processing processes and their influence on the characteristics of animal origin products	TN_K1_W04, TN_K1_W12
Skills: (In terms of skills, the graduate can)	U1	apply appropriate technologies for the processing of selected raw materials of animal origin and apply appropriate research methods to assess the quality of selected raw materials and products of animal origin	TN_K1_U03
	U2	work individually and / or in a team	TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	exchange of experiences with experts in the field enabling solutions to issues related to food technology of animal origin	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		Technology of production of meat and meat products. Technology and hygiene of production of milk and milk products. Selected aspects of production technology and quality assessment of animal origin raw materials and products, for example: structure and chemical composition of meat and the impact of post-slaughter changes on its technological properties, production technology and quality assessment of selected assortments of meat products (e.g. sausages, offal sausages, canned meat, convenient food from poultry meat), production technology and quality assessment of selected assortments of dairy products (e.g. raw milk assessment and food milk technology, rennet and cottage cheeses technology, butter and milk powder technology).	
Examination methods:		Written credit, Test and / or report on the laboratory classes and / or activity on the laboratory classes	

Subject name:		Food biotechnology	ECTS: 5
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	Selected biotechnological processes used in food technology, the creation of novel foods, biosynthesis of technologically important food additives and functional food ingredients, including the benefits and risks of biotechnology in the food industry and the basic requirements for conducting industrial processes based on the use of microorganisms	TN_K1_W01, TN_K1_W02, TN_K1_W03, TN_K1_W04, TN_K1_W05, TN_K1_W06, TN_K1_W07, TN_K1_W08, TN_K1_W09, TN_K1_W11
Skills: (In terms of skills, the graduate can)	U1	Characterize, implement in practice and evaluate the course of selected biotechnological processes and the properties of the obtained bioproducts, and use these processes in food production, creating new food, biosynthesis of food additives of technological importance and functional food ingredients, including operating the basic scientific and research equipment, and preparing a report on the conducted experiments, including a critical analysis of the results obtained as part of individual and group work	TN_K1_U01, TN_K1_U03, TN_K1_U04, TN_K1_U06, TN_K1_U08, TN_K1_U09
Social competences: (Within the scope of competence, the graduate is ready to)	K1	For continuous self-education and use of the potential of biotechnological processes and bioproducts obtained in this way in the food industry	TN_K1_K01, TN_K1_K03, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The syllabus contents implemented during the lectures and laboratory classes are appropriately characterized and used in practice of selected biotechnological processes based on biosynthesis, biotransformation, biohydrolysis and fermentation applied in food technology, the production of food ingredients and technologically functional additives.	
Examination methods:		Written exam, Written credit	

Subject name:		Pathogens in water and food	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	harmful biological factors associated with water and food and the risk of their impact to human health and food safety	TN_K1_W01, TN_K1_W04, TN_K1_W07, TN_K1_W09
	U1	select and characterize methods used to detect pathogens in water and food and also be the ones to interpret the results.	TN_K1_U01, TN_K1_U03, TN_K1_U06
	K1	use the adequate procedures for assessment of the degree of food contamination	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The harmful biological factors in water and food - bacteria, fungi (molds and yeasts), viruses and parasites. Pathways of microbiological contamination of water and food. Types of disease caused by water- and foodborne pathogens: intoxication, toxico-infection and infection. Endo- and exotoxins produced by bacteria and mycotoxins - molds metabolites. Morphological and physiological characteristics of pathogens that may grow in water and food. Influence of the environment and handling of food and water on the microbial growth.	
Examination methods:		Written credit	

Subject name:		New food products development	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the research methods and techniques used in the development of new and existing food products	TN_K1_W04, TN_K1_W06, TN_K1_W11
	W2	the characteristic of the types of product innovation and their role in modernising the food market	TN_K1_W08, TN_K1_W11
Skills: (In terms of skills, the graduate can)	U1	plan and practically carry out the process of development and marketing of a food product, select recipe ingredients, the method of packaging and preservation of the food product and prepare the information necessary for unit labelling	TN_K1_U01, TN_K1_U02, TN_K1_U03, TN_K1_U04, TN_K1_U07, TN_K1_U08
	U2	obtain, analyse and interpret information from a variety of sources necessary for evaluating the chances and opportunities of launching a new product and identifying consumer needs in the food market	TN_K1_U03, TN_K1_U07, TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	exchange of knowledge and team/interdisciplinary work in the preparation and implementation of the project work	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The subject is related to the provision of knowledge, competences and skills in the field of food product development	
Examination methods:		Project	

Subject name:		Food additives and contaminants	ECTS: 1
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	the role of food additives, the meaning and origin of food contaminants in food production and their impact on health and safety of consumers	TN_K1_W03
	U1	choose the appropriate food additives to achieve technological and nutritional benefits	TN_K1_U02
	K1	the justified and appropriate use of additives in food production	TN_K1_K02, TN_K1_K03, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		Aspects related to: general overview of food additives utilization in regard to their legal aspects, preservatives, antioxidants, acidity regulators, colouring and flavouring agents, sweeteners and hydrocolloids, pesticide residues in food and selected food contaminants.	
Examination methods:		Written exam	

Subject name:		Sensory analysis	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	specificity of sensory analysis as a field of analytics and methods used in sensory and consumer research	TN_K1_W06
	U1	prepare and present samples of products for sensory evaluations, taking into account the conditions of evaluation and methodology.	TN_K1_U01
	U2	select quality attributes and carry out assessments of selected product groups using various methods.	TN_K1_U03
	U3	collate and present the results obtained from sensory research, as well as work as a team in the development and implementation of project.	TN_K1_U06
	K1	consciously acting related to the evaluation of the sensory quality of food products.	TN_K1_K01, TN_K1_K03
	K2	carrying out sensory and consumer testing of food products using various methods.	TN_K1_K03, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The subject is related to the provision of knowledge, competences and skills in the use of various methods in sensory and consumer research in food products, with particular emphasis on applicability in scientific projects and professional practice.	
Examination methods:		Written credit, Report	



Subject name:		Consumer behaviour	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	social and psychological determinants of consumer behavior in the food market and their implications for development of the food product offer	TN_K1_W08, TN_K1_W10, TN_K1_W11
	U1	select methods and tools for observing, measuring, and calculating data in the field of consumer behavior on the food market and critically analyze and interpret the obtained data, assess the credibility of selected actions	TN_K1_U03, TN_K1_U06
	U2	plan, organize and perform in a team simple project tasks related to consumer behavior	TN_K1_U03, TN_K1_U07, TN_K1_U08
	K1	contact and exchange of experiences and knowledge with experts to search for the best solutions to specific problems related to among others food production, supply chain, food storage and human nutrition	TN_K1_K01, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		Consumer behaviour – core concepts and determinants; factors determining decision-making processes related to the choice of food, consumer attitudes and behaviour in relation to selected food categories, methods of studying consumer behaviour and using the results in marketing activities.	
Examination methods:		Test (written or computer based), Project	

Subject name:		Food production hygiene	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p>	W1	methods and techniques used in food processing, preservation, storage and testing	TN_K1_W06
	W2	principles of Good Manufacturing Practice and Good Hygiene Practice as well as systems, regulations and standards related to food quality and safety assurance	TN_K1_W07, TN_K1_W12
	W3	factors determining the quality and health safety of food with various degrees of processing as well as health hazards related to food and methods of reducing the risk associated with these hazards	TN_K1_W09
	U1	conduct experiments and solve practical issues in the field of basic sciences, and then implement them in activities carried out within the scope of directional issues in the field of food processing	TN_K1_U03
	U2	assess the risk of hazards in accordance with the applicable standards of Good Manufacturing Practice and Hygiene Practice and food quality and safety systems with the use of various tools	TN_K1_U05
	U3	plan, organize and perform independently or in a team project tasks related to production hygiene and food and nutrition safety assessment	TN_K1_U08
	U4	work in a group, contact and exchange experiences and knowledge with experts in order to search for the best solutions to specific problems, including with food production, supply chain, food storage and human nutrition	TN_K1_U07, TN_K1_U08
	U5	taking responsibility for the production of high-quality, health-promoting food that meets quality standards and health safety requirements	TN_K1_U08, TN_K1_U09
Course content ensuring the achievement of learning outcomes:		The subject is related to the provision of knowledge, competences and skills in the field of hygiene in food production, understood as creating conditions for the production of food of adequate health quality, i.e. safe from the point of view of consumer health, health risks and their assessment, as well as mandatory health safety systems in food production.	
Examination methods:		Written credit, Project, Assessment of work in the laboratory	

Subject name:		Catering technology	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the methods and techniques used in the processing, storage and evaluation of food produced in catering establishments	TN_K1_W06
	W2	the principles of good manufacturing and good hygienic practice during preparation of various dishes	TN_K1_W07
	W3	the principles of gastronomic production organization in accordance with the legal requirements for ensuring the quality and safety of food and the principles of sustainable development.	TN_K1_W08
Skills: (In terms of skills, the graduate can)	U1	conduct culinary experiments, select methods, and tools for observation, evolution and estimation during processing, storage, and food testing, as well as critically analyze and interpret the obtained data	TN_K1_U03
	U2	individually or collaboratively plan, organize, and complete simple food production and evaluation' assignments.	TN_K1_U08
	U3	communicate with the environment using specialized terminology appropriate for food/catering industry	TN_K1_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	take the responsibility for producing high-quality, healthy food that meets quality standards and health safety requirements	TN_K1_K03
	K2	contact and exchange experiences and knowledge with experts in order to seek the best solutions to food production-related problem	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The course provides knowledge on the effect of the culinary processes, selection of food raw materials, and the technological process on obtaining the optimal quality of dishes from various groups.	
Examination methods:		Test (written or computer based), Report	

Subject name:		Food packaging and contact materials	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the theoretical issues in the field of packaging and materials intended for contact with food	TN_K1_W01
	W2	the methods and techniques used to test packaging and materials intended for contact with food	TN_K1_W06
Skills: (In terms of skills, the graduate can)	U1	communicate with the environment using specialized terminology appropriate for the field of study in the field of packaging and materials intended for contact with food and select packaging materials for contact with food in accordance with legal requirements	TN_K1_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	recognizes the importance of knowledge in the field of packaging and materials intended for contact with food, as well as expanding its scope through the use of various literature sources	TN_K1_K01
	K2	fulfill his or her professional duties in a socially responsible, entrepreneurial, ethical manner, consistent with the public interest, as well as with respect for professional traditions and intellectual property protection law	TN_K1_K02
Course content ensuring the achievement of learning outcomes:		Introduction to packaging - types and short characteristics, safety of packaging for contact with food, legal framework for FCM, declarations of compliance, methods of conducting overall migration from FCM and organoleptic assessment, FCM hazards, active and intelligent materials/packaging, smart solutions for opening the packaging, smart packaging, packaging enriched with active ingredients (antimicrobial compounds, antioxidants, etc.), emitters, absorbers and various new solutions in this field, modern and traditional packaging production technologies, new and innovative packaging: natural biopolymers derived from waste materials, biotechnological synthesis, polymerization of plant raw materials, as well as edible packaging and their properties.	
Examination methods:		Test (written or computer based), Written credit, Report	

Subject name:		Basics of dietetics	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the role of different dietary patterns/diet and their impact on human functioning and health	TN_K1_W02
	W2	the methods of dietary intervention and the use of therapeutic diets in the management of selected diseases	TN_K1_W10
Skills: (In terms of skills, the graduate can)	U1	plan menu and assess the nutritional value of therapeutic diets	TN_K1_U02
	U2	plan an adequate diet for patients suffering from different diseases	TN_K1_U06
Social competences: (Within the scope of competence, the graduate is ready to)	K1	provide nutritional counseling in an ethical manner and with respect for needs and desires of patients from different groups	TN_K1_K02
	K2	use library and/or web-based data for research, analysis and educational purposes	TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The course provides the basic knowledge of nutritional patterns in the prevention and treatment of non-communicable diseases and the relationship between certain macro- and micronutrients deficiencies and diet-related diseases.	
Examination methods:		Written credit, Test (written or computer based), Assessment of work in the laboratory	

Subject name:		Nutrition of selected population groups	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the nutritional needs of different age groups of people including pregnant and lactating women; the most frequent nutritional problems connecting with the nutrition of different population groups	TN_K1_W02, TN_K1_W03
Skills: (In terms of skills, the graduate can)	U1	plan and modify nutrition of different groups of people and using data about nutrition and nutritional status in nutritional rationalization	TN_K1_U02, TN_K1_U06
Social competences: (Within the scope of competence, the graduate is ready to)	K1	critical assessment of the effects of nutritional rationalization and continuous expansion of knowledge and improvement of professional competences	TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of the knowledge, competencies, and skills in the field of the aspects of nutrition of selected population groups with emphasis on specific nutritional characteristics and nutritional needs of different population groups (infants, young children and adolescents, adults - including pregnant and lactating women, menopausal women, and the elderly. The students will provide the knowledge and competencies on the characteristic features of the diet in the context of nutritional status and health.	
Examination methods:		Written credit	

Subject name:		Alcoholic beverages and human being	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	chemical and physical properties of ethanol, including conversions ethanol contained in alcoholic beverages undergoes in body (administration, metabolism, elimination) and ethanol-organs interactions in human bod.	TN_K1_W01, TN_K1_W02, TN_K1_W09
	W2	the production of alcoholic beverages, monitoring of ethanol content in the body, healthy and economical results of drinking alcoholic beverages	TN_K1_W01, TN_K1_W02, TN_K1_W09
Skills: (In terms of skills, the graduate can)	U1	critically analyze the information obtained during the course	TN_K1_U01, TN_K1_U02
	U2	make an in-depth review of the scientific literature related to the use of ethanol in human being	TN_K1_U01, TN_K1_U02, TN_K1_U06
Social competences: (Within the scope of competence, the graduate is ready to)	K1	recognize the role that ethanol plays in human being and is ready to broaden the knowledge on this subject	TN_K1_K02, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		Impact of ethanol on human organism and the conscious and safe use of ethanol in human being.	
Examination methods:		Written credit, Presentation, Report	

Subject name:		Contemporary methods of management	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the issues of contemporary management methods	TN_K1_W12
	W2	basic issues in the field of modern enterprise management and concerning the main functions of the management process.	TN_K1_W12
Skills: (In terms of skills, the graduate can)	U1	search, analyze and use information to evaluate management methods used in companies in the sector	TN_K1_U04, TN_K1_U06
	U2	identify opportunities and threats for enterprises for the introduction of modern management methods	TN_K1_U04, TN_K1_U06
Social competences: (Within the scope of competence, the graduate is ready to)	K1	to develop in the group the assumptions for the introduction of selected management methods	TN_K1_K02
	K2	is aware of the essence of modern business management methods	TN_K1_K02
Course content ensuring the achievement of learning outcomes:		It provides knowledge, competences and skills in the field of modern management methods, with particular emphasis on the directions of evolution of management concepts, the essence of modern management concepts and their application in organization management processes.	
Examination methods:		Written credit, Project, Assessment of activity during classes	



Subject name:		Drugs, medicines and smart food components and additives	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	chemical, physical and biological properties of active substances e.g. depressants, pain killers, stimulants, antacids, antimicrobials, antivirals or mind altering substances delivered and administrated deliberately in human body in form of cures or food with expected and unexpected effects, their interaction with human organs and systems in equilibrium	TN_K1_W01, TN_K1_W02
Skills: (In terms of skills, the graduate can)	U1	indicate how certain food (including raw foods) are equipped with active substances, what can be healthy, economic and social results of drugs and food active substances consumption and their interactions.	TN_K1_U02
Social competences: (Within the scope of competence, the graduate is ready to)	K1	work independently and in the team	TN_K1_K01, TN_K1_K02
Course content ensuring the achievement of learning outcomes:		Drugs, medicines, therapeutic window, side effects, dependence, tolerance - definitions and applications. Antacids. Hydrogen pump mechanism of action. Analgesics. Stimulants. Depressants. Inflammation in the body. Anti-inflammatory substances. Antibacterial substances (penicillin). Antivirals. Mind altering drugs (LSD, mescaline, THC). Foods and raw materials containing different chemically active substances e.g. natural antibiotics, stimulants or painkillers. Brain-belly interaction. Relation between food and mind. Allergenic additives and their relation to brain and body. Blood sugar and human behavior.	
Examination methods:		Written credit, Report	

Subject name:		Functional food	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the concepts of functional food and the rules for its labelling and marketing and know examples of foods and food additives with a specific health promoting function	TN_K1_W03, TN_K1_W08
Skills: (In terms of skills, the graduate can)	U1	acquire, analyse and interpret information from a variety of sources necessary for an understanding of how food ingredients or foods may perform a health promoting function and thus be used in the production of functional foods, working either alone or in a team	TN_K1_U07, TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	exchange knowledge and work in a team/interdisciplinary way in preparing and carrying out project work	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of the knowledge, competencies, and skills in the field of functional food. The students should know how to identify and what are the main classification rules of functional food, the principles of correct labelling of functional food and its marketing in accordance with current legal regulations. The students will also be familiarized with the characteristics and applications of selected food groups and food components included in functional food.	
Examination methods:		Project	

Subject name:		Dietary prevention	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	nutrients and other bioactive compounds in food products and their impact on human functioning and health	TN_K1_W02
	W2	nutrition intervention strategies that actually improved the health of populations/ nations	TN_K1_W02
Skills: (In terms of skills, the graduate can)	U1	assess the composition, energy and nutritional value of diets and determine their impact on the health and well-being	TN_K1_U02
	U2	plan and perform projects aimed to improve the health and/or prevent health problems using nutritional strategies	TN_K1_U02, TN_K1_U08
	U3	list the most common diet-related diseases and describe their risk factors connected with life style and nutrition	TN_K1_U02
Social competences: (Within the scope of competence, the graduate is ready to)	K1	contact and exchange of experience and knowledge with experts in order to search for the best solutions in prevention of specific health problems	TN_K1_K03
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of knowledge, competences and skills in the field of assessing the safety and effectiveness of different dietary approaches to population groups and individuals at risk of diet-related diseases.	
Examination methods:		Report, Presentation	

Subject name:		Trends in food and consumption	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	the trends in food and nutrition and their role in modernising the food market and consumption	TN_K1_W08, TN_K1_W11
	U1	acquire, analyse and interpret information from a variety of sources necessary to understand how new trends/innovations in processing, food technology and consumption affect nutrient quality and quantity, product quality and consumer health through working independently or as part of a team	TN_K1_U04, TN_K1_U07, TN_K1_U08
	K1	exchange of knowledge and team/interdisciplinary work in the preparation and implementation of the project work	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The subject is related to providing knowledge, competences and skills in the area of food and consumption trends and their role in modernising the food and consumption market.	
Examination methods:		Project	

Subject name:		Alternative diets	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	processes and phenomena occurring in the human body in the process of nutrition and the impact of nutrients on the human body	TN_K1_W02
	W2	functions, significance and impact of alternative nutritional models on the functioning of the human body and its health	TN_K1_W02
Skills: (In terms of skills, the graduate can)	U1	assess the composition, energy and nutritional value of alternative diets, determine their impact on the growth, development, functioning and health of the body	TN_K1_U02
	U2	plan and perform on their own or in a team simple project tasks for arranging and assessing the correctness of menus in accordance with the requirements of specific diets	TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	contact and exchange of experience and knowledge with experts in order to search for the best solutions to specific problems related to the use of alternative feeding models	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The course is related to the provision of knowledge, competences and skills in the field of assessing the safety and effectiveness of alternative diets in various population groups.	
Examination methods:		Report	

Subject name:		Environment, diet and health	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	the important role of humans as a part of the environment and the effects of the environment on the human organism	TN_K1_W01, TN_K1_W02
	W2	the role of the influence of selected environmental factors, nutrients in health and/or health disorders	TN_K1_W02, TN_K1_W03
	W3	the role of the influence of environmental factors and nutrients on alterations in the organism's functioning	TN_K1_W02, TN_K1_W03
	U1	search and critically analyze information regarding the components and/or contaminants of the environment on alterations in body function (i.e., on the functioning of various body systems)	TN_K1_U02
	U2	plan their own professional development by updating their knowledge of health-promoting attitudes	TN_K1_U04
	K1	conscious assessment of the impact of nutrition and environmental pollution as elements influencing human health and determining the development of pro-health attitudes	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		The course provides knowledge, competencies and skills in the area of relations between nutrition, selected environmental health hazards and the functioning of the organism as well as the promotion and development of appropriate pro-health behaviors.	
Examination methods:		Test (written or computer based), Report	

Subject name:		Protection of intellectual property	ECTS: 1
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	the theoretical issues in the field of protection of intellectual property	TN_K1_W01
	W2	the economic, social, environmental, ethical and legal conditions of food production and the principles of new product development, distribution and offering food to consumers, including the basic concepts and principles of industrial property protection and copyright	TN_K1_W11
	U1	communicate with the environment using specialized terminology	TN_K1_U07
	K1	recognize the importance of knowledge in the field of protection of intellectual property, as well as expanding its scope through the use of various sources	TN_K1_K01
	K2	fulfill his or her professional duties in a socially responsible, entrepreneurial, ethical manner, consistent with the public interest, as well as with respect for professional traditions and intellectual property protection law	TN_K1_K02
Course content ensuring the achievement of learning outcomes:		Basic concepts of intellectual property rights related with protection of the work, inventions, trademarks, personal and property copyrights, public use, and citation law, as well as responsibility for copyright infringement.	
Examination methods:		Written exam	

Subject name:		Technological design of food industry plants	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	has consistent knowledge in the field of design and development of technological lines in the field of food processing	TN_K1_W04, TN_K1_W05, TN_K1_W06, TN_K1_W08
	U1	make a simple technological project / technological line with the use of a computer programs supporting the design, eg AutoCAD	TN_K1_U04, TN_K1_U05, TN_K1_U08
	K1	organizing work in a team and assuming various functions as well as planning and improving his own work and the work of team members	TN_K1_K01, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		Knowledge of issues related to technical aspects and principles of designing processes in food technology, taking into account the formal requirements contained in regulations, standards and other applicable documents, and with the use of computer support. Team written studies or presentation of prepared studies, discussion, argumentation.	
Examination methods:		Written credit, Project, Assessment of activity during classes	



Subject name:		Technological design of food gastronomy plants	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	technical standards and norms in technological design.	TN_K1_W04, TN_K1_W05, TN_K1_W06
	W2	rules on methods, techniques, tools and technologies used for the technological design of food service establishments.	TN_K1_W07, TN_K1_W08, TN_K1_W12
Skills: (In terms of skills, the graduate can)	U1	acquire and analyze information necessary to prepare a technological project of food service establishments.	TN_K1_U04, TN_K1_U06
	U2	plan and realize practical activities related to technological and functional design of food service establishments.	TN_K1_U05, TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	organize individual or team work when technological designing of food service establishments.	TN_K1_K01, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The course is related to provision of knowledge, competences and skills in term of proper organization a facilities of food service establishments taking into account such aspects like: organizational and functional, hygienic, technical and technological as well as the selection and proper setting of technological equipment, implementation of basic design calculations and use of software supporting the design process - AutoCAD program.	
Examination methods:		Test (written or computer based), Project	

Subject name:		Methodology in technological projects	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	Has in-depth theoretical knowledge in the field of research methodology used to solve a defined related problem with food production and shaping its quality and safety.	TN_K1_W01, TN_K1_W02, TN_K1_W03, TN_K1_W04, TN_K1_W05, TN_K1_W06, TN_K1_W07, TN_K1_W08, TN_K1_W09, TN_K1_W10
Skills: (In terms of skills, the graduate can)	U1	Define the goal, develop a literature review and design the methodological assumptions of the technological project, review and assess the current state of methodological solutions in the field of the project being implemented and adapt the available methodological solutions for the needs of the project being implemented, critically analyze the results of the experiments taking into account the advantages and disadvantages of the methods and research procedures, correctly apply, among others thanks to the ability to collaborate, be creative and communicate in a group.	TN_K1_U01, TN_K1_U02, TN_K1_U03, TN_K1_U04, TN_K1_U05, TN_K1_U06, TN_K1_U07, TN_K1_U08, TN_K1_U09
Social competences: (Within the scope of competence, the graduate is ready to)	K1	Continuous deepening of knowledge, searching for research solutions and solving methodological problems in professional life.	TN_K1_K01, TN_K1_K02, TN_K1_K03, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The selection of the topics of technological projects and the related need for students to develop methodological assumptions take into account the learning outcomes achieved so far in the field of knowledge, skills and social competences assumed within the various modules and subjects included in the study plan. Preparation of the research methodology verifies the practical use of learning outcomes related to the field of study. The learning outcomes specific to the research methodology being developed are deepened and implemented under the substantive supervision of academic teachers.	
Examination methods:		Project, Presentation	

Subject name:		Methodology in nutritional projects	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	in-depth theoretical knowledge in the field of research methodology used to solve a defined problem related to the assessment of food and nutrition in order to formulate nutritional recommendations leading to the rationalization of nutrition of individuals and various population groups.	TN_K1_W01, TN_K1_W02, TN_K1_W03, TN_K1_W04, TN_K1_W05, TN_K1_W06, TN_K1_W07, TN_K1_W08, TN_K1_W09, TN_K1_W10, TN_K1_W11, TN_K1_W12
Skills: (In terms of skills, the graduate can)	U1	define the goal, develop a literature review and design the methodological assumptions of the nutritional project, review and assess the current state of methodological solutions in the field of the project being implemented and adapt the available methodological solutions for the needs of the project being implemented, critically analyze the results of the experiments taking into account the advantages and disadvantages of the methods and research procedures, correctly apply, among others thanks to the ability to collaborate, be creative and communicate in a group.	TN_K1_U01, TN_K1_U02, TN_K1_U03, TN_K1_U04, TN_K1_U05, TN_K1_U06, TN_K1_U07, TN_K1_U08, TN_K1_U09
Social competences: (Within the scope of competence, the graduate is ready to)	K1	continuous deepening of knowledge, searching for research solutions and solving methodological problems in professional life.	TN_K1_K01, TN_K1_K02, TN_K1_K03, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The selection of the topics of nutritional projects and the related need for students to develop methodological assumptions take into account the learning outcomes achieved so far in the field of knowledge, skills and social competences assumed within the various modules and subjects included in the study plan. Preparation of the research methodology verifies the practical use of learning outcomes related to the field of study. The learning outcomes specific to the research methodology being developed are deepened and implemented under the substantive supervision of academic teachers.	
Examination methods:		Presentation, Assessment of activity during classes	

Subject name:		Food safety and quality management in food production	ECTS: 1
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	principles of good production, hygienic practice and systems and standards related to the provision of quality and safety of food	TN_K1_W07
	W2	factors determining the quality and health of food with varying degrees of processing and health threats related to food and methods of risk reduction related to these threats	TN_K1_W09
Skills: (In terms of skills, the graduate can)	U1	analyze and evaluate existing solutions responsible for food economy, identify problems and opportunities for professional activities, seek new solutions and ways to implement them with modern tools, including experiments, analytical methods, computer simulations and information and communication techniques and others	TN_K1_U04
	U2	implement activities in the field of technological design and functional plants for food production and collective nutrition, taking into account marketing strategy and in accordance with the applicable standards of good production and hygiene practice and food safety and safety systems	TN_K1_U05
Social competences: (Within the scope of competence, the graduate is ready to)	K1	making liability for the production of high-quality health food, meeting the quality standards and health requirements	TN_K1_K03
	K2	responsible performing professional roles, including compliance with professional ethics and deepening knowledge related to the profession	TN_K1_K04
Course content ensuring the achievement of learning outcomes:		Control of cleaning and disinfection processes, powers and obligations of employees and employers in the field of production hygiene, sample hygiene plan, control of physical, chemical and microbiological threats in food production, food legislation in the field of production hygiene, technical and hygienic-sanitary requirements GHP, GMP and HACCP for plants, organization of sanitary supervision over food production, internal security and food quality management systems in food production plants, GHP, GMP and HACCP. Audits, auditors. Quality Management Systems: TQM, QMS (ISO 9000, 14000, 22000, ETC.), AQAP, IFS, BRC.	
Examination methods:		Written credit	

Subject name:		Food safety and quality management in gastronomy	ECTS: 1
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p> <p>Social competences: (Within the scope of competence, the graduate is ready to)</p>	W1	HACCP principles and quality management requirements	TN_K1_W07
	W2	internal audit process	TN_K1_W08
	U1	evaluate the implementation and functioning of quality management systems in gastronomy	TN_K1_U01
	K1	able to be responsible for the safety and quality of products in gastronomy	TN_K1_K02
Course content ensuring the achievement of learning outcomes:		The concept of food quality and safety and their importance in gastronomy. Basic food safety requirements, EU regulations. Hazards in gastronomy, sources of origin and ways of prevention, elimination or minimization to acceptable levels. HACCP principles within the framework of ensuring food safety. HACCP procedures and records. Critical Control Points (CCPs) in gastronomy. Methods of monitoring CCP in gastronomy. Difficulties and benefits of implementing HACCP principles in gastronomy. ISO 9001. Guidelines for auditing management systems. Verification - the role of audit in ensuring food safety and quality. Guidelines for the audit of management systems according to ISO 19011: preparation, performance and documentation of an audit in gastronomy	
Examination methods:		Test (written or computer based)	

Subject name:		Technological projects	ECTS: 5
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	issues related to subject of the prepared project and understands the possibility of patent protection of the prepared solution.	TN_K1_W01, TN_K1_W02, TN_K1_W03, TN_K1_W04, TN_K1_W05, TN_K1_W06, TN_K1_W07, TN_K1_W08, TN_K1_W09, TN_K1_W10, TN_K1_W11, TN_K1_W12
Skills: (In terms of skills, the graduate can)	U1	correctly carry out experiments using the available material resources and technical or theoretical or other, aimed at achieving the assumed design goal, and an appropriate research methodology; synthesizes the obtained results, formulating conclusions and recommendations for practical use, prepares a written study in the form of a draft and correctly presents the project to the group.	TN_K1_U01, TN_K1_U02, TN_K1_U03, TN_K1_U04, TN_K1_U05, TN_K1_U06, TN_K1_U07, TN_K1_U08, TN_K1_U09
Social competences: (Within the scope of competence, the graduate is ready to)	K1	constantly expand knowledge and skills related to professional life and search for its reliable sources in the era of digital civilization, and is committed to the reliable preparation of the project.	TN_K1_K01, TN_K1_K02, TN_K1_K03, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The selection of the subject of the project takes into account the learning outcomes achieved by the student so far in terms of knowledge, skills and social competences assumed in the various modules and subjects included in the study curricula. The preparation of the project verifies the practical use of learning outcomes related to the field of study. At the same time, the learning outcomes specific to the subject of the project are deepened and implemented under the substantive supervision of academic teachers.	
Examination methods:		Project, Presentation	

Subject name:		Nutritional project	ECTS: 5
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	issues related to the subject of the prepared project and understands the importance of proper nutrition for ensuring health and reducing the risk of diet-related diseases.	TN_K1_W01, TN_K1_W02, TN_K1_W03, TN_K1_W04, TN_K1_W05, TN_K1_W06, TN_K1_W07, TN_K1_W08, TN_K1_W09, TN_K1_W10, TN_K1_W11, TN_K1_W12
Skills: (In terms of skills, the graduate can)	U1	correctly carry out experiments using the available material resources and technical or theoretical or other, aimed at achieving the assumed design goal, and an appropriate research methodology; synthesizes the obtained results, formulating conclusions and recommendations for practical use, prepares a written study in the form of a draft and correctly presents the project to the group.	TN_K1_U01, TN_K1_U02, TN_K1_U03, TN_K1_U04, TN_K1_U05, TN_K1_U06, TN_K1_U07, TN_K1_U08, TN_K1_U09
Social competences: (Within the scope of competence, the graduate is ready to)	K1	constantly expand the knowledge and skills related to professional life and search for its reliable sources in the era of digital civilization, and is committed to the reliable preparation of the project.	TN_K1_K01, TN_K1_K02, TN_K1_K03, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The selection of the subject of the project takes into account the learning outcomes achieved by the student so far in terms of knowledge, skills and social competences assumed in the various modules and subjects included in the study curricula. The preparation of the project verifies the practical use of learning outcomes related to the field of study. At the same time, the learning outcomes specific to the subject of the project are deepened and implemented under the substantive supervision of academic teachers.	
Examination methods:		Project	

Subject name:		Seminar (food technology)	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	issues related to food science, with particular emphasis on the contemporary aspects of food processing and quality	TN_K1_W02, TN_K1_W03, TN_K1_W04, TN_K1_W06, TN_K1_W08, TN_K1_W09, TN_K1_W10, TN_K1_W11
	Skills: (In terms of skills, the graduate can)	U1	acquire literature data in order to develop a specific issue, using the knowledge resources consciously, critically assess the available information and synthesize it
		U2	prepare and deliver presentations on a given topic
		U3	discuss using appropriate argumentation and evaluate the statements of other participants of the diploma seminar, as well as take into account various points of view in the discussion
	Social competences: (Within the scope of competence, the graduate is ready to)	K1	constant deepening of acquired knowledge and skills in the era of scientific and technological progress
		K2	recognition of the importance of ethical issues in professional life and the need to protect intellectual property and the social responsibility of conducting professional activity
Course content ensuring the achievement of learning outcomes:		The students should be able to review and discuss on the content of a selected publication related to food processing and quality, to prepare the presentation of a selected issue expanding the knowledge base in the field of food processing, taking into account areas that arouse scientific and/or social controversy. The presentation of the planned path of the student's professional development.	
Examination methods:		Presentation, Assessment of activity during classes	



Subject name:		Seminar (human nutrition)	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	issues related to food science, with particular emphasis on contemporary aspects of human nutrition	TN_K1_W02, TN_K1_W03, TN_K1_W04, TN_K1_W06, TN_K1_W08, TN_K1_W09, TN_K1_W10, TN_K1_W11
	Skills: (In terms of skills, the graduate can)	U1	acquire literature data in order to develop a specific issue, using the knowledge resources consciously, critically assess the available information and synthesize it
	U2	prepare and deliver presentations on a given topic	TN_K1_U07
	U3	discuss using appropriate argumentation and evaluate the statements of other participants of the diploma seminar, as well as take into account various points of view in the discussion	TN_K1_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	constant deepening of acquired knowledge and skills in the era of scientific and technological progress	TN_K1_K01
	K2	recognition of the importance of ethical issues in professional life and the need to protect intellectual property and the social responsibility of conducting professional activity	TN_K1_K02, TN_K1_K03, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		The students should review and discuss of the content of a selected publication related to human nutrition, and present a selected issue expanding the knowledge base in the field of human nutrition, taking into account areas that arouse scientific and/or social controversy. Presentation of the planned path of the student's professional development.	
Examination methods:		Presentation, Assessment of activity during classes	

Subject name:		Bioengineering in food industry	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the concept of bioengineering, biotechnological material	TN_K1_W01, TN_K1_W02, TN_K1_W05, TN_K1_W06
	W2	individual stages and processes of biopolymer production	TN_K1_W01, TN_K1_W02, TN_K1_W03, TN_K1_W04
Skills: (In terms of skills, the graduate can)	U1	to give strains and conditions of the bioreactor for selected examples of biopolymers	TN_K1_U01, TN_K1_U02, TN_K1_U03, TN_K1_U04
	U2	to design a manufacturing process	TN_K1_U03, TN_K1_U04, TN_K1_U05, TN_K1_U06, TN_K1_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	prepare bio-process design and carry out thorough it analysis of the technological and economic parameters	TN_K1_K01, TN_K1_K02, TN_K1_K03, TN_K1_K04
Course content ensuring the achievement of learning outcomes:		Concepts of biotechnology, bioengineering and biological material. The stages of the production process will be discussed, using examples of specific biopolymers - enzymes, polysaccharides or vitamins. They will be prepared to design their own "bio" process on an industrial scale.	
Examination methods:		Test (written or computer based), Report, Presentation	

Subject name:		Cutting-edge technologies in food industry	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p>	W1	the principles and applications of modern and innovative techniques used in food technology and, in particular, their impact on food quality.	TN_K1_W08
	U1	gain the data and critically evaluate the effect of modern technology on process performance, product quality.	TN_K1_U06, TN_K1_U09
	U2	describe the production process of new type of product in which cutting edge technologies are applied and critically evaluate the consumer acceptance of such solution.	TN_K1_U08
Course content ensuring the achievement of learning outcomes:		Principles and applications of selected non-thermal technologies, nanotechnology, 3D printing, extrusion, membrane technologies and microencapsulation. Impact of selected non-thermal technologies on progress of unit operations and quality of food. Designing and describing the application of selected cutting-edge technologies for the production of new/invented products or processes.	
Examination methods:		Test (written or computer based), Report	

Subject name:		Design thinking in food industry	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	what innovation is, and is able to describe the Stanford Design Thinking Model; student knows the steps of design thinking: empathy, design, re-design, ideate, prototype, teams, testing	TN_K1_W01
Skills: (In terms of skills, the graduate can)	U1	to plan and organize work individually and in a team	TN_K1_U08
Course content ensuring the achievement of learning outcomes:		Vocabulary from the area of the specialist language for the field of study, varied in terms of scope due to student's interests.	
Examination methods:		Project, Report	

Subject name:		Drying	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the role of drying in the food industry, water properties in food, the influence of phase changes on food properties, the kinetics of food drying, factors influencing the drying process, methods of food drying, methods of pre-treatment before drying, microencapsulation by drying	TN_K1_W01, TN_K1_W04, TN_K1_W05, TN_K1_W06, TN_K1_W11
Skills: (In terms of skills, the graduate can)	U1	conduct an experiment of drying selected raw materials with selected methods, assess the influence of various parameters/factors on the course of the process and properties of the obtained products	TN_K1_U01, TN_K1_U03, TN_K1_U07, TN_K1_U09
Course content ensuring the achievement of learning outcomes:		General characteristics of the drying process, including its energy consumption. The properties of water in food, influence of phase changes on the properties of dried food. Kinetics of food drying, factors influencing the drying process. Food drying methods, methods of pre-treatment before drying, including PEF, US treatment. Microencapsulation of food ingredients by drying.	
Examination methods:		Test (written or computer based), Report, Presentation	

Subject name:		Herbs, food and health	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
<p>Knowledge: (In terms of knowledge, the graduate knows and understands)</p> <p>Skills: (In terms of skills, the graduate can)</p>	W1	the basic active substances found in popular herbs and spices, their healing properties and their influence on the human body	TN_K1_W01, TN_K1_W02, TN_K1_W03, TN_K1_W10
	U1	choose the right way to preserve herbs and spices and extract their active substances and use in food production.	TN_K1_U01, TN_K1_U03, TN_K1_U06
	U2	choose herbs and spices appropriate for use in a broadly understood phytotherapy.	TN_K1_U02, TN_K1_U06, TN_K1_U09
Course content ensuring the achievement of learning outcomes:		Primary and secondary metabolites of plants (including tannins, alkaloids, bitterness and others). Methods of producing plant preparations (extraction, decoction, maceration). Phytotherapy - concept and use. Characteristics of selected spice and medicinal plants (composition, properties, application). The use of plants in the kitchen, dietary prevention and diet therapy (including diseases of the digestive system, circulation and urinary system, liver, cancer, obesity). Methods of investigating the sensitivity of microorganisms to active substances present in plants (MIC and MBC).	
Examination methods:		Written credit, Presentation	

Subject name:		Physical properties of food	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	selected physical properties, with particular emphasis on sorption, optical, rheological, electrical and aerodynamic, acoustic, thermal, diffusion and surface properties of selected raw materials of plant and animal origin, as well as the properties of selected raw materials in the form of powders and criteria for assessing their suitability	TN_K1_W03
	W2	understands the classification of physical properties of food products, and also understands the methods and equipment used to determine these properties	TN_K1_W04
Skills: (In terms of skills, the graduate can)	U1	observe changes in the physical properties of food, measure selected physical properties of food and perform the necessary quantitative calculations and interpret the obtained results	TN_K1_U01
	U2	know how to use knowledge when selecting measurement methods and tools as well as making observations, measurements and calculations in the field of physical properties of food during production and processing	TN_K1_U03
Social competences: (Within the scope of competence, the graduate is ready to)	K1	recognize the importance of knowledge in the field of physical properties of food and the use of new measurement methods, as well as expanding its scope through the use of various literature sources	TN_K1_K01
Course content ensuring the achievement of learning outcomes:		Determination of the physical properties of food on the example of selected raw materials and food products in terms of their quality assessment using different methods and techniques.	
Examination methods:		Written credit, Report, Test (written or computer based)	

Subject name:		Prevention of food quality	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the issues related to the quality of food and its changes during storage	TN_K1_W01
	W2	the theoretical basis of the phenomena and changes occurring in raw materials, semi-finished products and food products naturally and under the influence of technological processes, storage and food testing	TN_K1_W04
Skills: (In terms of skills, the graduate can)	U1	assess the composition, energy and nutritional value of food products	TN_K1_U02
	U2	plan and organize work individually and in a team	TN_K1_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	take responsibility for the production of high-quality, pro-health food that meets quality standards and health safety requirements	TN_K1_K03
Course content ensuring the achievement of learning outcomes:		Understanding the quality aspects of food production, taking into account individual food ingredients, food changes during the production process and storage.	
Examination methods:		Project, Report, Test (written or computer based)	



Subject name:		Public health nutrition	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	fundamental problems in public health nutrition and indicators for the evaluation of diet quality	TN_K1_W03, TN_K1_W04
	W2	the tools, statistical analysis and rules of conducting epidemiological and public health research	TN_K1_W03, TN_K1_W04
Skills: (In terms of skills, the graduate can)	U1	construct and validate questionnaires used in nutritional studies	TN_K1_U03, TN_K1_U04
	U2	evaluate the quality of scientific publication on public health issues	TN_K1_U02
	U3	perform statistical analysis in epidemiological and public health research	TN_K1_U02
	U4	use dietary patterns to evaluate the risk of cardiovascular diseases	TN_K1_U02
Social competences: (Within the scope of competence, the graduate is ready to)	K1	work individually and in a team and is aware of constant training and use of objective sources of information	TN_K1_K02
Course content ensuring the achievement of learning outcomes:		Fundamental issues in public health nutrition. The role of nutrition in the prevention of diet-related diseases. Principles and methods of constructing and evaluating research tools in nutritional sciences. Practical aspects of basic and complex statistical analyzes.	
Examination methods:		Written credit, Report	

# Programme indicators

2023/24/S\_D/1/NoZ/TN/all

Name	Value
Potwierdzenie - na podstawie planu studiów, że student realizuje zajęcia z dziedziny nauk humanistycznych i/lub społecznych, którym przypisano nie mniej niż 5 punktów ECTS	5
Potwierdzenie - na podstawie planu studiów, że student ma możliwość wyboru zajęć, którym łącznie przypisano liczbę punktów ECTS nie niższą niż 30% ECTS określonych dla programu tych studiów	54/180 (30%)
Potwierdzenie, że program studiów o profilu ogólnoakademickim obejmuje zajęcia związane z prowadzoną w uczelni działalnością naukową, w wymiarze większym niż 50% liczby punktów ECTS, określonej dla programu tych studiów	128.63/180 (71.46%)
Potwierdzenie, że liczba punktów ECTS uzyskanych w programie studiów poprzez realizację zajęć z wykorzystaniem metod i technik kształcenia na odległość jest nie wyższa niż 75% ogólnej liczby punktów ECTS w programie studiów o profilu ogólnoakademickim	0/180 (0%)
Liczba godzin w programie	2506