SZKOŁA GŁÓWNA GOSPODARSTWA WIEJSKIEGO

Biochemistry & enzymology

Educational subject description sheet

Basic information

Field of study Course Offer for exchange students - first degree studies (BA programmes) **Speciality** - **Organizational unit** Course Offer for exchange students **Study level** first degree studies (BA programmes) **Study form** full-time studies **Education profile** General academic	**Didactic cycle** 2024/25 **Subject code** PWMPWM1S_D.A100000.02441.24 **Lecture languages** english **Mandatory** Obligatory subjects **Block** Basic subjects **Disciplines** Food technology and nutrition

Coordinator	Iwona Wojtasik-Kalinowska
Teacher	Iwona Wojtasik-Kalinowska

Period	**Examination**	**Number of ECTS points**
Winter semester	Exam **Activities and hours** Lecture: 30 Laboratory exercises: 30	4

Goals

Code	Goal
C1	The aim of the course is to get the knowledge about the function of living matter, based on its molecular structure and metabolism, as well as to provide the knowledge and skills in the field of the possibility of using enzymes in various branches of the food industry in order to obtain the desired changes in raw materials, to improve the quality of the final product, or reduce production costs. The course improve the knowledge of food processing technology.

Entry requirements

Knowledge of general food technology and general, inorganic and organic chemistry

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student 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		Written credit
W2	rules of technological processes with the use of enzymes for food preservation and processing		Written credit
W3	the enzymatic processes influencing the composition and properties of raw materials and food products		Written credit
Skills – Student 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		Report, Assessment of work in the laboratory
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		Report, Assessment of work in the laboratory
Social competences – Student 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		Assessment of work in the laboratory

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	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 processes and functions of selected metabolic pathways, including metabolic interdependencies and metabolism regulation mechanisms; Enzymatic processes influencing the composition and properties of raw materials and food products.	W1, W3	Lecture, Laboratory exercises
2.	Rules of technological processes with the use of enzymes for food preservation and processing.	W2	Lecture, Laboratory exercises

No.	Course content	Subject's learning outcomes	Activities
3.	Conducting experiments and solving practical problems in the field of enzyme kinetics and their applications, and then implement them in activities in the field of food processing.	U1	Lecture, Laboratory exercises
4.	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.	U2	Lecture, Laboratory exercises
5.	Critical evaluation the effects of enzyme use in the food industry, and use objective sources of scientific information and critically evaluate them.	K1	Lecture, Laboratory exercises

Course advanced

Activities	Methods of conducting classes
Lecture	Lecture
Laboratory exercises	Problem lecture

Activities	Examination method	Percentage
Lecture	Written credit	50%
Laboratory exercises	Assessment of work in the laboratory	40%
Laboratory exercises	Report	10%

Activities	Credit conditions
Lecture	written exam
Laboratory exercises	Protocol of grades obtained by the student during tests, reports and completion of the lecture part of the course

Literature

Obligatory

1. Whitehurst R.J., van Oort M. (red.): Enzymes in Food Technology. Wiley-Blackwell, Ames 2010.
2. Barbosa-Canovas G.V., Tapia M.S., Cano M.P. (red.): Novel Food Processing Technologies. CRC Press, New York 2004.
3. Belitz. H. D., Grosch W., Schieberle P. Food Chemistry 4th Edition, Springer, 2009

Optional

1. Biochemistry, 5th edition, Jeremy M Berg, John L Tymoczko, Lubert Stryer, New York: W H Freeman; 2002.
2. Enzymes in Food and Beverage Processing, Muthusamy Chandrasekaran, Apple Academic Press, 2015
3. Food Processing Technology, Fellows P. J., Woodhead Publishing, 2016
4. Enzymes in Food Biotechnology, Production, Applications, and Future Prospects. Kuddus M., Academic Press is an imprint of Elsevier. 2019.
5. Chosen articles from scientific journals

Calculation of ECTS points

Activity form	Activity hours*
Lecture	30
Laboratory exercises	30
Preparation for the exam	20
Preparation for the test	20
Student workload	**Hours** 100
Number of ECTS points	**ECTS** 4

* hour means 45 minutes