SZKOŁA GŁÓWNA GOSPODARSTWA WIEJSKIEGO

Biopolymers in the production of food packaging

Educational subject description sheet

Basic information

Field of study Biotechnology **Speciality** - **Organizational unit** Faculty of Biology and Biotechnology **Study level** first cycle (engineering degree) **Study form** full-time studies **Education profile** General academic	**Didactic cycle** 2024/25 **Subject code** BBTBTjS_D.320.01627.24 **Lecture languages** english **Mandatory** Elective subjects **Block** Major subjects **Disciplines** Biological sciences

Coordinator	Karolina Kraśniewska
Teacher	Karolina Kraśniewska, Sabina Galus

Period Semester 6	**Examination** Pass with grade **Activities and hours** Lecture: 15	**Number of ECTS points** 1

Goals

Code	Goal
C1	Gaining basic knowledge about natural and biodegradable polymers used in the production of food packaging.

Entry requirements

Knowledge about organic chemistry, food chemistry, microbiology and food packaging

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student knows and understands:			
W1	the student knows the basic division and characteristics of biopolymers used for the production of biodegradable including edible packaging	BTj_K3_W03, BTj_K3_W09	Written credit
W2	the student knows the basic functions of biopolymers and the possibilities of their use for the production of packaging as well as knows the methods and possibilities of modifying the raw material composition of biopolymers packaging in order to obtain their advantageous functional properties	BTj_K3_W09, BTj_K3_W10	Written credit

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Introduction to food packaging, and importance and benefit of biodegradable packaging. Types of biopolymers used in the production of packaging. Biodegradability of polymers. Characteristics and preparation of selected biopolymers of plant, animal and microbiological origin. Modification of biopolymers in order to give new or improve the already existing functional properties. Possibilities of using biopolymers as modern food packaging materials (edible packaging, active and intelligent packaging).	W1, W2	Lecture

Course advanced

Activities	Methods of conducting classes
Lecture	Lecture

Activities	Examination method	Percentage
Lecture	Written credit	100%

Activities	Credit conditions
Lecture	The condition for passing the course is to obtain a minimum of 51% of points from written test.

Literature

Obligatory

1. A.A. Vincente, J.A.C. Teixeira, M.A.P. Ribeiro Cerqueira, O.L. da Silva Ramos, R.N.C. Pereira. 2016. Edible Food Packaging: Materials and Processing Technologies. Apple Academic Press Inc., UK
2. Han J., Innovations in Food Packaging, Elsevier (second edition), USA.
3. Gutierrez T.J. Polymers for Agri-Food Applications, Springer, USA.

Optional

1. A. Kumar Nadda, S. Sharma & R. Bhat. 2022. Biopolymers Recent Updates, Challenges and Opportunities, Springer Nature, Switzerland
2. Galus S., Arik Kibar A.E., Gniewosz M., Kraśniewska K. (2020). Novel materials in the preparation of edible films and coatings – a review. Coatings, 10(7), 674, 1-14.
3. Kraśniewska K., Galus S., Gniewosz M. (2020). Biopolymers-Based Materials containing silver nanoparticles as active packaging for food applications-a review. Int. J. Mol. Sci, 21(3), 698.
4. Z. Florjańczyk, S. Penczak, Chemia polimerów (tom III), Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa.
5. Pozycje literaturowe zaproponowane przez prowadzącego.

Calculation of ECTS points

Activity form	**Activity hours***
Lecture	15
Preparation for the test	10
Student workload	**Hours** 25
Number of ECTS points	**ECTS** 1

* hour means 45 minutes

Effects

Code	Content
BTj_K3_W03	The graduate knows and understands key aspects of biotechnology
BTj_K3_W09	The graduate knows and understands living organisms and their place in the natural environment, and how they can be used for the good of humanity;
BTj_K3_W10	The graduate knows and understands terms, principles and theories related to processes and mechanisms which have shaped the world of nature, knowing how they can be used efficiently;