

## GDAŃSK UNIVERSITY

## Subject card

Biotechnology and Lipid Technology, PG_00058261								
Biotechnology								
		Academic year of realisation of subject			2023/2024			
second-cycle studies		Subject group			Optional subject group Subject group related to scientific research in the field of study			
Full-time studies	Full-time studies		Mode of delivery			at the university		
1					Polish			
2		ECTS credits			6.0			
general academic profile		Assessment form			exam			
Department of Chemi					Ity of Chemistry			
Subject supervisor								
Teachers		dr hab. inż. Dorota Martysiak-Żurowska dr inż. Agata Sommer						
Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
Number of study hours	30.0	0.0	30.0	0.0		15.0	75	
E-learning hours inclu								
Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study		SUM	
Number of study hours	75	20.		55.0			150	
The aim of the course is for students to familiarizing with lipid biotechnology and technology in production processes of industrial importance in the food, fuel and pharmaceutical industries, as well as with the directions and possibilities of their development.								
Course out	come	Subject outcome				Method of verification		
[K7_U05] is able to apply instrumental methods of quantitative and qualitative analysis and studies on activity of biomolecules, select and apply diagnostic and analytical methods in the field of his/her specialty with particular emphasis on genetic, molecular and microbiological diagnostics and diagnostics based on antigen-antibody reaction		The student is able to use instrumental analysis methods to study the properties and profiles of lipid biomolecules using the latest analytical methods.			[SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject			
[K7_W07] knows issues related to plant and animal raw materials, their quality, impact on human health, processing technology and chemical and biological hazards resulting from process treatment and storage		Analyzes and defines properties nutritional and physicochemical properties of plant and animal raw materials and fatty products obtained from them. He is aware of the impact of their quality on human health.			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects			
biotechnological processes, understands the specificity of the		The student has knowledge of biotechnological and technological techniques used in the fat industry. Analyzes unit processes used in obtaining, modifying and refining of fats. Defines the goals and methods of obtaining lipids and their derivatives through biotechnology and their use in the food, pharmaceutical and technical industries. The student knows the possibilities and limitations of process design biotechnological.			[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation			
	February 2023         February 2023         second-cycle studies         Full-time studies         1         2         general academic pro-         Department of Chemi         Subject supervisor         Teachers         Lesson type         Number of study         hours         E-learning hours inclu         Learning activity         Number of study         hours         Course out         [K7_U05] is able to a         instrumental method         quantitative and qual         analysis and studies         biomolecules, select         diagnostic and analy         in the field of his/her         particular emphasis or         molecular and microid         diagnostics and diag         on antigen-antibody         [K7_W07] knows issis         plant and animal raw         their quality, impact or         health, processing te         chemical and biologi         products, possibilities         limitations related to         biotechnological prod         understands the spe         biotechnological prod	February 2023         second-cycle studies         Full-time studies         1         2         general academic profile         Department of Chemistry, Technolog         Subject supervisor         Teachers         Lesson type       Lecture         Number of study       30.0         hours       Participation in classes included plan         Number of study       75         The aim of the course is for students processes of industrial importance in directions and possibilities of their du Course outcome         [K7_U05] is able to apply instrumental methods of quantitative and qualitative analysis and studies on activity of biomolecules, select and apply diagnostics and analytical methods in the field of his/her specialty with particular emphasis on genetic, molecular and microbiological diagnostics and diagnostics based on antigen-antibody reaction         [K7_W07] knows issues related to plant and animal raw materials, their quality, impact on human health, processing technology and chemical and biological hazards resulting from process treatment and storage         [K7_W08] has a profound knowledge of methods of obtaining biotechnological products, possibilities and limitations related to the design of biotechnological processes, understands the specificity of the biotechnological processes,	February 2023       Academic y realisation         second-cycle studies       Subject gro         second-cycle studies       Mode of de         1       Language de         2       ECTS cred         general academic profile       Assessmer         Department of Chemistry, Technology and Bioche       Subject supervisor         Teachers       dr hab. inz. Du         Lesson type       Lecture         Lesson type       Lecture         Lesson type       Lecture         Number of study hours       30.0         Number of study hours       0.0         Learning activity       Participation in didactic classes included in study plan         Number of study hours       75         The aim of the course is for students to familiarizing processes of industrial importance in the food, fuel directions and possibilities of their development.         [K7_U05] is able to apply diagnostic and analytical methods of quantitative and qualitative analysis and studies on activity of biomolecules, select and apply diagnostics and diagnostics based on antigen-antibody reaction         [K7_W07] knows issues related to plant and animal raw materials, their quality, impact on human health, processing technology and chemical and biological hazards resulting from process treatment and storage       Analyzes and nutritional and profities of drive diverse of materials and biotechnological procesese, understands the specificity of the biotec	February 2023         Academic year of realisation of subject           second-cycle studies         Subject group           Full-time studies         Mode of delivery           1         Language of instruction           2         ECTS credits           general academic profile         Assessment form           Department of Chemistry, Technology and Biochemistry of Food         Subject supervisor           dr hab. inz. Dorota Martysiał         dr hab. inz. Dorota Martysiał           Teachers         dr hab. inz. Dorota Martysiał           Lesson type         Lecture         Tutorial           Lesson type         Lecture         Tutorial           Lesson type         Lecture         Tutorial           Learning nours included: 0.0         E-learning hours included: 0.0           Learning activity         Participation in didactic classes included in study plan         Participation i consultation th processes of industrial importance in the food, fuel and pharmace directions and possibilities of their development.           Course outcome         Subject outcome           IX-U05] is able to apply instrumental methods of quantitative and qualitative analysis and studies on activity of biomolecules, select and apply diagnostics and anglydical methods.         Analyzes and defines proper instrumental analysis methoids, their quality, impact on human health, processing technological nothariad from them He is aware of the impact of	February 2023       Academic year of realisation of subject         second-cycle studies       Subject group         Full-time studies       Mode of delivery         1       Language of instruction         2       ECTS credits         general academic profile       Assessment form         Department of Chemistry, Technology and Biochemistry of Food > Fact         Subject supervisor       dr hab. inž. Dorota Martysiak-Zurow dr inž. Agata Sommer         Teachers       dr hab. inž. Dorota Martysiak-Zurow dr inž. Agata Sommer         Lesson type       Lecture       Tutorial       Laboratory       Project         Number of study       30.0       0.0       30.0       0.0         Number of study       75       20.0       20.0         The aim of the course is for students to familiarizing with lipid biotechnolo processes of industrial importance in the food, fuel and pharmaceutical in consultation hours instrumental analysis methods to fuel and pharmaceutical in fuertones and possibilities of their development.         Course outcome       Subject outcome       Subject outcome         [K7_U05] is able to apply instrumental analysis methods to fuel and animal raw materials, molecular and microbiogical diagnostics based on antigen-antibody reaction       Analyzes and defines properties nutritional and physicochemical properties of plant and animal raw materials, und biological nucesses, understands the specificity of the is aware of the im	February 2023       Academic year of realisation of subject       2023/         second-cycle studies       Subject group       Option         second-cycle studies       Subject group       Option         Full-time studies       Mode of delivery       at the         1       Language of instruction       Polish         2       ECTS credits       6.0         general academic profile       Assessment form       exam         Department of Chemistry, Technology and Biochemistry of Food -> Faculty of C       Subject supervisor       dr hab. inz. Dorota Martysiak-Zurowska         Teachers       dr hab. inz. Dorota Martysiak-Zurowska       dr inz. Agata Sommer         Lesson type       Lecture       Tutorial       Laboratory       Project         Number of study       30.0       0.0       30.0       0.0         Learning nours included: 0.0       Eaerning activity       Participation in didactic classes included in study plan       Course outcome       Subject outcome       Self-st         Number of study hours       75       20.0       55.0       Study the properties and profiles of fuel analysis methods to st study the properties and profiles of plant and animal raw materials, their quality, materials, their quality, materials, their quality, materials, their quality encolories and encolories of plant and animal raw materials, their quality, materials, and tefines propertie	February 2023       Academic year of realisation of subject       2023/2024         second-cycle studies       Subject group       Optional subject of Subject group relatives research in the field         Full-time studies       Mode of delivery       at the university         1       Language of instruction       Polish         2       ECTS credits       6.0         general academic profile       Assessment form       exam         Department of Chemistry, Technology and Biochemistry of Food -> Faculty of Chemistry       Subject supervisor       dr hab. inz. Dorota Martysiak-Zurowska         Teachers       dr hab. inz. Dorota Martysiak-Zurowska       dr inz. Agata Sommer       Seminar         Lesson type       Lecture       Tutorial       Laboratory       Project       Seminar         Number of study       30.0       0.0       30.0       0.0       15.0         hours       Fatiopation in consultation hours       Self-study       Self-study         The atim of the course is for students to familiary with lipid biotechnology and technology in processes of industrial importance in the field of fuel and pharmaceutical industries, as well as of directions and possibilities of their development.       [SU4] Assessment of use methods and to (SU4] Assessment of use fuel do his/her specialty with particular emphasis on genetic, molecular, and mainytical methods.       [SW1] Assessment of use knowledge gain subjecd	

Subject contents	Lecture: 1. Scopes of biotechnological activities used in obtaining, purifying, processing and modifying lipids. 2. Biotechnology in the edible fat industry. 3. Biotechnology in the production of biofuels. 4. Biotechnology in the production of detergent ingredients and lipid derivatives for the cosmetics industry. 5. Biotechnological use of lipids for pharmaceutical purposes. Liposome technology in basic research and clinical pharmacology. 6. Commercialized lipid-based products (including glycerol) produced biotechnologically 7. Technologies for extracting, purifying and modifying food fats. Lab: Biotechnological processes of fat modification (esterification) and analysis of the impact of these processes on the physicochemical properties of fats. The use of biotechnological methods for the degradation of waste animal and plant fats. Seminar Student presentations based on the most current articles in the field presented in the course.						
Prerequisites and co-requisites	Knowledge of the basics of food chemistry and food analysis.						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	seminar	60.0%	20.0%				
	laboratory	60.0%	30.0%				
	exam	60.0%	50.0%				
Recommended reading	Basic literature	<ul> <li>Biotechnologia żywności . WNT, pod red. W. Bednarski, A. Repsa</li> <li>Technologia Tłuszczów Jadalnych. Niewiadomski H. WNT, Warszawa,</li> <li>Surowce Tłuszczowe. Niewiadomski H. WNT, Warszawa,</li> <li>Lipid Biotechnology Ed. Tsung Min k., Gardner H.</li> </ul>					
	Supplementary literature	Current scientific articles on the issues of the subject, e.g. Journal of American Oil Chemists Society, Eur. J. Lipid Sci. Technol., INFORM (wyd. AOCS).					
	eResources addresses	Adresy na platformie eNauczanie: Biotechnologia i technologia lipidów 2023/2024 - Moodle ID: 33542 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33542					
Example issues/ example questions/ tasks being completed	Chemical and enzymatic interesterification of edible fats.Obtaining cocoa butter substitutes by fractional crystallization method.Microbial bioconversion of fat waste.Conditions for biocatalysis to obtain biosurfactants.						
Work placement	Not applicable						