

Nazwa zajęć/ <i>Course title:</i>	<b>Biotechnologiczne wykorzystanie drożdży</b>	ECTS	<b>2</b>
Nazwa zajęć w j. angielskim/ <i>Course title in English:</i>	<b>Biotechnological use of yeast</b>		
Zajęcia dla kierunku studiów/ <i>Degree program name:</i>	Biotechnology		

Język kursu/ <i>Course language:</i> English		Poziom studiów/ <i>Study level:</i>	
Typ studiów/ <i>Form of studies:</i> <input checked="" type="checkbox"/> intramural <input type="checkbox"/> extramural	Status zajęć/ <i>Course status</i> <input type="checkbox"/> podstawowe/ <i>basic</i> <input checked="" type="checkbox"/> kierunkowe/ <i>major</i>	<input type="checkbox"/> obowiązkowe/ <i>mandatory</i> <input checked="" type="checkbox"/> do wyboru/ <i>elective</i>	Semestr/ <i>Semester:</i> 6 <input type="checkbox"/> semestr zimowy/ <i>winter semester</i> <input checked="" type="checkbox"/> semestr letni/ <i>summer semester</i>
Rok akademicki/ <i>Academic year:</i>		Numer katalogowy/ <i>Catalogue number:</i>	<b>2022/2023</b> <b>BBT_BTa-1S-6L-47_6</b>

Koordynator zajęć/ <i>Course coordinator:</i>	<b>Dr Kamil Piwowarek</b>			
Prowadzący zajęcia/ <i>Teachers responsible for the course:</i>	Employees of the Department of Food Biotechnology and Microbiology			
Założenia, cele i opis zajęć/ <i>Aims, objectives and description of the course:</i>	<p><b>Lecture topics:</b> Systematic, morphological and physiological characteristics of yeasts important in biotechnology. Overview of the processes related to the use of yeast in the fermentation industry (yeast, baking, distilling, winemaking, brewing). Protein synthesis (SCP), obtaining vitamins, lipids, biosurfactants, etc. The use of yeast to obtain biopreparations (bioaccumulation of elements).</p> <p><b>Exercise topics:</b> The morphology of different yeast species. Study of the physiological properties of selected yeast species. Identification of a selected yeast species on the basis of morphological and physiological characteristics. Wine yeast. Fermentation properties of various strains of wine yeast. Preparation of settings and setting of wine fermentation. Assessment of different strains of wine yeast on the basis of chemical and organoleptic analysis of wine. Alcoholic fermentation - distilling. Grain mash and molasses wort as substrates for alcoholic fermentation. Preparation of substrates and inoculation. Analysis of the mash and evaluation of the efficiency of the alcoholic fermentation process. Production of baker's yeast biomass. Preparation of substrates and setting of the culture. Evaluation of the efficiency of the biomass breeding process.</p>			
Formy dydaktyczne, liczba godzin/ <i>Teaching forms, number of hours:</i>	a) lectures; number of hours 15; b) laboratory classes; number of hours 15			
Metody dydaktyczne/ <i>Teaching methods:</i>	Lectures, laboratory experiments, discussion, individual work and team work, consultations, remote education if necessary (e.g. pandemic).			
Wymagania formalne i założenia wstępne/ <i>Formal requirements and prerequisites</i>	Previously completed classes in the following subjects: "Biochemistry", "General Microbiology", "Food Microbiology" Basic knowledge of the transformation of proteins, fats and carbohydrates and the participation of enzymes in these processes.			
Efekty uczenia się/ <i>Learning outcomes:</i>	treść efektu przypisanego do zajęć/ <i>the content of the effect assigned to the course:</i>		Odniesienie do efektu kierunkowego/ <i>Relation to the course outcomes</i>	Siła dla ef. kier*/ <i>Impact on the course outcomes*</i>
Wiedza (absolwent zna i rozumie) / <i>Knowledge: (the graduate knows and understands)</i>	W1	has a consistent knowledge of the morphological and physiological features of yeast enabling their identification and use in various biotechnological processes	K_W06 K_W08 K_W09	3 2 2
	W2	knows the basic technologies in which yeast is used	K_W08 K_W09 K_W01	2 2 3
Umiejętności (absolwent potrafi) / <i>Skills: (the graduate is able to)</i>	U1	is able to plan and carry out experiments on the use of biological material in the production process	K_U12 K_U13	2 2
	U2	is able to critically assess the functionality and legitimacy of technical and technological solutions used in the biotechnological process (e.g. process conditions related to the multiplication of biological material, selected devices and unit operations related to the extraction, purification and preservation of the bioproduct)	K_U10	2
Kompetencje (absolwent jest gotów do) / <i>Competences: (The graduate is ready to)</i>	K1	has a well-crafted strategy needed to update, store and increase knowledge on biotechnology topics	K_K01 K_K02	1 1
Treści programowe zapewniające uzyskanie efektów uczenia się: <i>/Program contents ensuring the achievement of the learning outcomes:</i>	Knowledge and understanding of yeast metabolism for the practical application of these unicellular eukaryotes in biotechnological processes.			

Sposób weryfikacji efektów uczenia się/ <i>Methods of the verification of the learning outcomes:</i>	Effects: W1, W2, U1, U2 - tests during laboratory classes or classes conducted remotely Effects: W1, U1, U2, K1 - activity during the discussion of a defined issue, evaluation of experiments performed during classes (report) Effects W-U - written exam in direct contact or remotely using MTeams (if necessary)
Szczegóły dotyczące sposobów weryfikacji i form dokumentacji osiągniętych efektów uczenia się /Details on the verification methods and of the ways of documenting the learning outcomes:	Name lists of partial grades from tests together with those tests (laboratory classes), the content of examination questions along with the grades.
Elementy i wagi mające wpływ na ocenę końcową/ <i>Elements and weights influencing the final grade:</i>	The final grade is calculated as the sum of the points obtained for each element (taking into account their weight). Colloquiums during laboratory classes - 37.5% Score for the experiment reports - 12.5% Exam grade - 50% The condition for passing the course is to obtain a minimum of 51% of points including all elements.
Miejsce realizacji zajęć/ <i>Teaching place:</i>	Lecture hall and laboratory at the Department of Food Biotechnology and Microbiology.
Literatura/Literature: <ol style="list-style-type: none"> <li>1. Bisson LF (2004) The Biotechnology of Wine Yeast, Food Biotechnology, 18(1), 63-96.</li> <li>2. Nandya SK, Srivastava RK (2018) A review on sustainable yeast biotechnological processes and applications, Microbiological Research, 207, 83-90.</li> <li>3. Willaert RG (2018) Yeast Biotechnology 2.0, Fermentation, 4(4), 98.</li> <li>4. Willaert RG (2021) Yeast Biotechnology 4.0, Fermentation, 7, 69.</li> <li>5. Mattanovich D, Sauer M, Gasser B (2014) Yeast biotechnology: teaching the old dog new tricks, Microbial Cell Factories, 13, 34.</li> </ol>	
UWAGI/ANNOTATIONS	

\*) 3 – zaawansowany i szczegółowy, 2 – znaczący, 1 – podstawowy/ 3 – significant and detailed, 2 – considerable, 1 – basic,

Wskaźniki ilościowe charakteryzujące moduł/przedmiot/*Quantitative summary of the course:*

Szacunkowa sumaryczna liczba godzin pracy studenta (kontaktowych i pracy własnej) niezbędna dla osiągnięcia zakładanych dla zajęć efektów uczenia się - na tej podstawie należy wypełnić pole ECTS/ <i>Estimated number of work hours per student (contact and self-study) essential to achieve the presumed learning outcomes - basis for the calculation of ECTS credits:</i>	55 h
Łączna liczba punktów ECTS, którą student uzyskuje na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich lub innych osób prowadzących zajęcia/ <i>Total number of ECTS credits accumulated by the student during contact learning:</i>	1.2 ECTS