University of Gdańsk

Subject card

Subject name and code	Food Biotechnology, PG_00081888						
Field of study	Chemistry						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2026/2027			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study			
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	3		Language of instruction	Polish			
Semester of study	6		ECTS credits	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Laboratory of Bionanotechnology -> Department of Molecular Biotechnology -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor	dr Joanna Jeżewska-Frąckowiak					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Additional information: student's own work, work in pairs, biotechnology experiment, preparation of results, problem-solving task - design						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		5.0		15.0	50
Subject objectives	familiarizing students with microorganisms and the basic processes used in food biotechnology familiarizing students with modern methods used in food biotechnology, including the detection of genetically modified food using the PCR method						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEML3_K02] Works individually demonstrating initiative and independence of activity and cooperates in a team fulfilling various roles in it.	Individually and in pairs, conducts planned experiments, discusses and solves problem tasks and develops results.	[SK2] presentation/project/paper/ report [SK5] implementation of a problem task [SK8] observation of student's independent or team work
[CHEML3_U02] Performs analyses using experimental methods and draws conclusions based on them.	Operates the equipment independently, selects experimental conditions and verifies their correctness.	[SU1] oral statement/conversation/ discussion [SU6] demonstration of practical skills [SU8] observation of student's independent or team work
[CHEML3_W05] Has basic knowledge of the chemical specialisation studied.	Knows classical and molecular techniques used in food biotechnology.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
[CHEML3_U07] Prepares documented elaboration on a specific problem in the field of selected chemical and physical issues.	Documents the results of laboratory tests in a notebook, analyzes them and comments on them. Prepares a worksheet for a problem task.	[SU2] presentation/project/paper/ report [SU3] text preparation/written work [SU5] implementation of a problem task [SU8] observation of student's independent or team work
[CHEML3_K05] Observes established procedures in laboratory work and is responsible for the safety of her/his and others' work.	Works in accordance with the principles of safety procedures in a biotechnology laboratory.	[SK6] demonstration of practical skills [SK8] observation of student's independent or team work
[CHEML3_K03] Establishes priorities in the right way for the implementation of tasks specified by herself/himself and/or by others.	Prepares reports and studies in a timely manner.	[SK3] text preparation/written work [SK5] implementation of a problem task
[CHEML3_W10] Enumerates and describes the basic aspects of the construction, operation and use of measuring apparatus and equipment used in experimental works in the field of chemistry and related sciences.	Knows the principles of operation of research equipment used in food biotechnology.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[CHEML3_U03] Selects the appropriate equipment and laboratory apparatus for conducting uncomplicated chemical experiments.	Plans experiments and properly operates assigned laboratory equipment.	[SU2] presentation/project/paper/ report [SU6] demonstration of practical skills [SU8] observation of student's independent or team work

Subject contents

Biotechnological production of rennet cheese with the addition of MSE bacterial starter culture, microscopy of milk bacterial species and MSE starter culture, detection of genetically modified Roundup Ready® soybeans in food samples by PCR, purification of total DNA from food samples using the silica bed method, detection of genetically modified Roundup soybeans Ready® in food samples by PCR (PCR reaction), detection of genetically modified Roundup Ready® soybeans in food samples by PCR, separation electrophoretic analysis of PCR reaction products.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	51.0%	67.0%
laboratory notebook - reports with results	51.0%	33.0%

Recommended reading	Basic literature	Bednarski W., Reps A. (red.) (2001) Biotechnologia żywności, WNT, Warszawa. Gniewosz M., Lipińska E. (red.) (2013) Zastosowanie wybranych drobnoustrojów w biotechnologii żywności. SGGW, Warszawa Querci M., Maretti M., Mazzara M. Badanie próbek żywności na obecność Genetycznie Zmodyfikowanych Organizmów. European Comission Joint Research Centre, World Health Organization, Regional Office for Europe Tengel C., Schüßler P., Setzke E., Balles J., Sprenger-Haußels M. (2001) PCR-Based Detection of Genetically Modified Soybean and Maize in Raw and Highly Processed Foodstuffs, BioTechniques 31:426-429.
	Supplementary literature	Libudzisz, Z., Kowal, K., Żakowska, Z. Mikrobiologia techniczna., Wydawnictwo naukowe PWN, 2008 Holt J.G., Krieg N.R., Sneath P.H.A., Staley J.T., Williams S.T. (2000) Bergeys Manual of Determinative Bacteriology, 9th ed., Lippincott Williams &Wilkins Glick, R.B., Pasternak, J.J., Patten, Ch.L., Molecular Biotechnology. Principles and applications of Recombinant DNA. 4th edition, ASM Press 2010 Joshi, V.K., Singh, R.S., Food biotechnology. Principles and Practices. 2012, IK International Publishing House Ltd., New Delhi
	eResources addresses	
Example issues/ example questions/ tasks being completed	test questions designing PCR primers, determining the length of the PCR product	
Work placement	Not applicable	

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