University of Gdańsk

Subject card

Subject name and code	Introduction to Biomathematics, PG_00178989						
Field of study	Mathematics						
Date of commencement of studies	October 2025		Academic year of realisation of subject	2026/2027			
Education level	Bachelor's studies		Subject group				
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	Polish			
Semester of study	3		ECTS credits	6.0			
Learning profile	academic		Assessment form	exam			
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor	dr Danuta Jaruszewska-Walczak					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	E-learning hours included: 0.0						
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	60		10.0	80.0	150	
Subject objectives	The aim is to knowing students with classical models and methods of biomathematics.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[MATL3_U08] is able to formulate definitions and theorems in an understandable way, both orally and in writing, and present correct mathematical reasoning regarding the acquired issues	The student is able to provide understanding of definitions and theorems as well as correct reasoning related to the topics learned in biomathematics.	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
[MATL3_K06] is ready to formulate opinions on basic mathematical issues	The student is able to express opinions on learned problems in biomathematics.	[SK1] oral statement/conversation/ discussion
[MATL3_K02] is ready to precisely formulate questions to deepen his/ her own understanding of a given topic or to find missing elements of reasoning	The student is ready to formulate questions aimed at deepening the understanding of a given topic.	[SK1] oral statement/conversation/ discussion [SK8] observation of student's independent or team work
[MATL3_W09] knows and understands the role and importance of proof in mathematics, as well as the concept of the importance of assumptions	The student knows and understands proofs of theorems and understands the role of constructing reasoning related to the issues learned for recurrence and differential equations applicable to modeling biological phenomena.	[SW4] test/exam - oral or written
[MATL3_K04] is ready to understand and appreciate the importance of intellectual honesty in one's own and other people's actions; is willing to act ethically	The student understands the importance of intellectual honesty in action and appreciates ethical conduct.	[SK8] observation of student's independent or team work
[MATL3_U09] is able to plan how to solve a specific problem and prepare a correct record of this solution, providing strict and precise justification for the correctness of his reasoning	The student is able to prepare a solution to a specific mathematical problem used to model biological phenomena, along with a precise justification for the correctness of the reasoning.	[SU4] test/exam - oral or written
[MATL3_K01] is ready to accept the limitations of his/her own knowledge and understands the need for further education	The student understands the limitations of their own knowledge and the need for lifelong learning.	[SK8] observation of student's independent or team work

Subject contents

Recurrence equations and ordinary differential equations in historical and heuristic population models, including discrete and continuous ones.

Differential and discrete logistic equation and with delay - applications in population dynamics.

Theory of first-order partial equations, von Foerster equation in the population model with age structure.

Autonomous system of ordinary differential equations, approximation by a linear system - application in predator-prey models.

Optional: main epidemic models; crocodile survival environment; dynamics of marital interactions; model of enzymatic reactions.

Prerequisites and co-requisites

Knowledge of the basics of differential and integral calculus.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
exam	51.0%	50.0%
observation of student behavior	51.0%	0.0%
test	51.0%	50.0%

Recommended reading

Basic literature	J. D. Murray, Wprowadzenie do biomatematyki, Wydawnictwo Naukowe PWN, 2006. U. Foryś, Matematyka w biologii, WNT, 2005. R. Rudnicki, Modele i metody biologii matematycznej, cz. I: Modele deterministyczne, IMPAN, 2014.
Supplementary literature	Not required
eResources addresses	

Example issues/ example questions/ tasks being completed	Not required
Work placement	Not applicable

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