University of Gdańsk

Subject card

Subject name and code	Modeling in School Mathematics, PG_00204262		
Field of study	Mathematics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	5.0
Learning profile	academic	Assessment form	credit
Conducting unit	Division of Didactics of Mathematics -> Institute of Mathematics -> Faculty of Mathematics, Physics and Informatics -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Elżbieta Mrożek	
	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	3.0	62.0	125

Subject objectives

The aim of the lecture is to discuss the most important mathematical concepts appearing in school mathematics and to familiarize students with the different methods of introducing these concepts depending on the level of education.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[MATL3_W06] knows and understands at an advanced level the structure of selected mathematical theories, is able to use mathematical formalism to build and analyze mathematical models	The student understands the meaning and significance of the construction of mathematical reasoning; knows software packages that provide data for symbolic calculations, for statistical calculations, for visualization and for learning geometry in order to build mathematical models.	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report

Subject contents

1. Modeling concepts in school mathematics - the position of modeling in school documentation (core curriculum, examination requirements, curricula)

2. Basic concepts of school mathematics and their modeling - natural numbers, fractions, integers - length, area and volume - function - probability

3. Visualization of selected mathematical concepts and mathematical theorems.

4. The role of DGS (dynamic geometry software) in shaping geometric intuitions.

5. Mathematical simulations and animations.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3"></td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>activity</td><td>51.0%</td><td>20.0%</td></tr>
<tr><td>observation of the student's attitude</td><td>51.0%</td><td>0.0%</td></tr>
<tr><td>exam</td><td>51.0%</td><td>60.0%</td></tr>
<tr><td>project</td><td>51.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. D. Haylock, Mathematics explained for primary teachers, SAGE, London 2010

2. S. Lang, Młodzi i macieka, GWO, Gdańsk 1995

3. J. Mason, L. Burton, K. Stacey, Mathematical thinking, WSiP, Warsaw 2005

4. A. Płocki, Probability calculus for teachers, PWN, Warsaw 1981

5. W. W. Sawyer, Figurative thinking in elementary mathematics, Wiedza Powszechna, Warsaw 1988

6. S. Turnau, Lectures on teaching mathematics, PWN, Warsaw 1990

7. P. Zarzycki, Modeling mathematical concepts, University of Gdańsk Publishing House, Gdańsk, 2019

8. Articles from magazines for teachers (Mathematics, Mathematics in School etc.)</td></tr>
<tr><td>Supplementary literature</td><td>not applicable</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">not applicable</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
</table>

Document generated electronically. Does not require a seal or signature.