Institute of Applied Mathematics			Semester 1. of the curriculum 2024-25-1			
Name of the subject:	Code of the subject:	Credits:	Weekly hours:			
				lec	sem	lab
Basic Mathematics	NMXMA1EBNF	6	full-time	2	2	0
Responsible person for the subject: Dr. Hegedüs, Gábor			Classification: associate professor			
Subject lecturer(s): Schmidt, Edit						
Prerequisites:						
Way of the assessment:	midterm grade					

Course description	
Goal:	To provide the basic mathematical knowledge necessary for learning the disciplines of engineering computing, to develop conceptual skills and to support the development of an engineering mindset by synthesising and extending the secondary school mathematics curriculum.
Course description:	Vector geometry. Trigonometric identities. Arithmetic of complex numbers. Global properties of real-valued functions, elementary functions. Sets and relations.

Lecture schedule	
Education week	Topic
1.	Geometric introduction to the concept of vectors. Basic operations on vectors. Decomposition of vectors, base, coordinates of a vector, coordinate system in plane and space. Operations on vectors given with coordinates.
2.	Trigonometric functions of angles of rotation, trigonometric identities, addition theorems. Scalar product of vectors and its calculation. Applications.
3.	Vector product and its calculation. Applications. Triple scalar product.
4.	Equation of a plane. Equations of a straight line.
5.	Number sets. Set of real numbers. Operations on real numbers, their properties. Solving equations on real numbers. n-th root, identities of n-th root.
6.	Interpretation and visualisation of complex numbers on the complex plane. Algebraic form of a complex number. Operations on complex numbers in algebraic form.
7.	Trigonometric and exponential forms of a complex number. Operations on complex numbers in these forms. Transition between different forms.
8.	n-th root on the set of complex numbers. Solving equations on complex numbers.
9.	Test 1.
10.	Illustration of real-valued functions of one variable. Operations on functions. Global properties of real-valued functions.
11.	Logarithm, identities of logarithm. Elementary functions, their properties and transformations (linear).
12.	Sets. Operations on sets. Relations, functions. Special functions. Cardinality of infinite sets.

13.	Test 2.
14.	Retake of the tests.

Midterm requirements	
Conditions for obtaining a mid-term grade/signature	Attendance at lectures and practice lessons (according to the Studies and Exams Code), writing the assessment test with a minimum of 60% and the total score of Test 1 and Test 2 with a minimum of 50% of the marks.

Assessment schedule	
Education week	Topic
0.	Assessment test
9.	Test 1 (material of weeks 1-8)
10.	Retake of the assessment test
13.	Test 2 (material of weeks 9-12)
14.	Retake of either the assessment test or any of the (or both) midterm tests

Method used to calculate the midterm grade

There will be homework assigned every second week (weeks 2, 4, 6, 8, 10, 12).
You can score a maximum of 100 points as follows:

- 10 points per homework assignment, of which 33,3% of the scores will be taken into account, i.e. max 20 points (HW);
- a maximum of 50 points (T1) may be scored on Test 1.
- a maximum of 30 points (T2) may be scored on Test 2.

Calculation of the final score of the semester: HW+T1+T2. (Both midterm tests and the assessment test must be successful – see above the midterm requirements– to obtain at least a pass (2) midterm mark).
A student whose absences from either lectures or practice lessons exceed the limit allowed in the Studies and Exams Code or who has not written neither the midterm tests nor the assessment test successfully will be banned.

Type of the replacement	
Type of the replacement of written test/mid-term grade/signature	Assessment test can be made up in week 10. (It can also be rewritten in week 14 if other requirements are satisfied.) Unwritten or unsuccessful midterm tests can be made up in week 14. (A student who wants to improve their scores can also rewrite the tests.) A student who is not banned, but has obtained an unsatisfactory midterm mark may attempt to correct it by rewriting either the assessment test or a final test once during a specified part of the examination period. You can score a maximum of 80 points of which 50% must be reached to pass.

Type of the exam (to be filled out only for subjects with exams)

Calculation of the exam mark (to be filled only for subjects with exams)

Final grade calculation methods:

0-49: fail (1)
50-61: pass (2)
62-73: satisfactory (3)
74-85: good (4)
86-100: excellent (5)
A student who obtained a midterm mark in the examination period will get a pass (2).

References	
Obligatory:	https://elearning.uni-obuda.hu
Recommended:	https://elearning.uni-obuda.hu
Other references:	https://elearning.uni-obuda.hu