UNIVERSITY OF WARMIŃSKO-MAZURSKI IN OLSZTYN
Faculty of Mathematics and Computer Science

Syllabus of the course - part A Repetition of elementary mathematics

17S1-REPEMATEL
ECTS: 2.00
CYCLE: 2023Z

CONTENTS

EXERCISES

Selected topics of set calculus. Function: domain, set of values, graph. Injection, surjection, bijection. Properties of functions: monotonicity, boundedness, periodicity, evenness, oddness. Transformations of graphs of functions. Complex function and inverse function. Review of elementary functions. 1 - Polynomials. Dividing polynomials. Bezout's theorem. Horner's scheme. Measurable primes of polynomials with integer coefficients. Graphs. 2. measurable functions. Decomposition into simple fractions. Graphs of homographic functions. Equations and inequalities of measurable functions. 3. exponential functions. Powers and their properties. Graphs of exponential functions. Exponential equations and inequalities. 4 Logarithmic functions. Logarithms and their properties. Logarithmic equations and inequalities. 5. trigonometric functions. The arc measure of an angle. Definitions of trigonometric functions. Graphs. Properties of trigonometric functions. Trigonometric equations and inequalities. 6. Cyclometric functions; properties and graphs.

LEARNING OBJECTIVE

To systematize the knowledge of elementary functions. To develop in students the ability to freely use the tools of elementary mathematics. To develop the ability to search, in available sources, for information related to solving problems in elementary mathematics.

DESCRIPTION OF THE SUBJECT'S LEARNING OUTCOMES IN RELATION TO THE DESCRIPTION OF THE CHARACTERISTICS OF THE SECOND LEVEL LEARNING OUTCOMES FOR QUALIFICATIONS AT LEVELS 6-8 OF THE POLISH QUALIFICATIONS FRAMEWORK IN RELATION TO SCIENTIFIC DISCIPLINES AND DIRECTIONAL OUTCOMES

Discipline effect symbols:	XP/I1A_U01+, XP/I1A_K08+, XP/I1A_K01+, XP/I1A_W07 XP/I1A_U18+
Directional effect symbols:	K1_W01+, K1_U01+, K1_K01+

LEARNING OUTCOMES:

Knowledge:

W1 - K1_W01 has knowledge in mathematics, including the properties of elementary functions and to learn the conceptual apparatus of mathematical analysis.

Skills:

Legal acts defining learning outcomes: 660/2015
Disciplines:
Course status: Compulsory
Subject group:A - core subjects **ISCED code.**
Direction of study: Informatics
Scope of education:
Profile of education:
Form of study: Part-time
Level of study: First degree
Year/semester:

Class type: Exercises **Number of hours per semester:** Exercises: 30.00 **Language of instruction:**Polish
Introductory subjects:
Prerequisite(s): Basic mathematical knowledge in the scope applicable in the secondary school along with the skills corresponding to it. scope of

Name of the org. unit implementing the subject: Department of Analysis and Differential Equations
Person responsible for implementation Subject: Dr. Grażyna Ciecierska
e-mail: grac@matman.uwm.edu.pl

Additional Notes:

U1 - K1_U01 has the ability to study the properties of elementary functions and use these properties to solve equations and inequalities.

Social Competencies:

K1 - K1_K01 understands the need for and knows the possibilities of continuing education (second and third degree studies, postgraduate studies, courses) - improving professional, personal and social competence.

TEACHING FORMS AND METHODS:

Exercises(W1;U1;K1;):Auditing exercises - solving tasks illustrating properties of basic classes of elementary functions.

FORM AND CONDITIONS OF VERIFICATION OF LEARNING OUTCOMES:

Exercises (Evaluation of work and cooperation in a group) - taking into account the active participation of the student in solving problems formulated during the exercises - U1

Exercises (Written Colloquium) - verification of skills and competencies formed during the exercises based on independent solving of tasks; Two colloquia: colloquium 1 - tasks concerning the study of basic properties of number sets and real functions, properties of polynomials and measurable functions, and solving equations and inequalities of both polynomial and measurable functions. colloquium 2 - tasks concerning properties of exponential, logarithmic, trigonometric

and cyclometric, as well as solving equations and inequalities determined by the above-mentioned classes of elementary functions. The condition for passing each colloquium is to obtain at least 50% of the maximum number of points - W1, K1

PRIMARY LITERATURE:

1. Cewe A., Nahorska H., Pancer I., Mathematical tables, Podkowa Publishing House, R. 2020.
2. Kowalczyk R., Niedziałomski K., Obczyński C., Mathematics for students and candidates for higher education, PWN Scientific Publishers, R. 2022
3. Blaszczyk A., Turek S., Mathematics. From basics to elements of higher mathematics, PWN Scientific Publishing House, R. 2021
4. Kielbasa A., Mathematics Baccalaureate 2023-2024. basic level, Lubatka Publishing House, R. 2022
5. Kulma D., How to pass the baccalaureate in mathematics at the basic level. Matura 2023, Elitmat Publishing House, R. 2022
6. Kulma D., How to pass the baccalaureate in mathematics at the extended level, Elitmat Publishing House, R. 2018
7. Gałęska E., Całka R., Repetytorium maturzysty - matematyka, Wyd. Greg, R. 2021

SUPPLEMENTARY LITERATURE:

1. Brynski M., Sparrow N., Szymanski K., Mathematics for the zero year of higher education. Elements of mathematical analysis, WNT Publishing House, R. 2009.
2. Drobka N., Szymanski K., Mathematics in secondary school. Repetition and collection of tasks, WNT Publishing House, R. 2007.
3. Babiański W., Chańko L., Czarnowska J., NOWA Teraz matura. Mathematics. Collection of matura tasks with digital learning support. Basic level, Wyd. Nowa Era, R. 2022
4. Kozłowska G., Żabka M., Żytka M., Repetitorium of elementary mathematics, Wyd. Wyd. Wyd. Politechniki Śląskiej, R. 1999.

Detailed description of the awarded ECTS credits - part B

17S1-REPEMATEL Repetition of elementary mathematics
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The number of ECTS credits awarded consists of:

1. Contact hours with an academic teacher:

- participation in: Exercises30 .0 h

0.0 h

TOTAL: 30.0 h

2. Student's independent work:

Preparation for exercises14 .00 h

Preparation for written tests16 .00 hr

TOTAL: 30.0 h

Contact hours + independent student work TOTAL : 60.0 h

1 ECTS credit = 25-30 h of average student work, number of ECTS credits= 60.0 h : 30.0 h/ECTS = 2.00 ECTS

Average: **2.0 ECTS**

- including number of ECTS credits for contact hours with direct participation of academic teacher 1.00 ECTS credits
- including the number of ECTS credits for hours of independent student work 1.00 ECTS credits