SYLLABUS FOR 2023/2024 ENROLMENT
MODE OF STUDY: FULL-TIME PROGRAMME

GENERAL INFORMATION

1. **Course** Mathematics for IT professionals

2. **Field of study** Computer Science

3. **Level of acquired education** First-cycle programme

4. **Number of ECTScredits 3**

5. **Number of hours per semester**

semester	lecture	classes	laboratory/foreign languagecourse	project/practical classes	Self-study	internship
I	30	30				

6. **Language of instruction: English**

7. **Lecturer dr hab. Józef Waniurski, prof. ABNS, mgr Magda Konieczna**

DETAILED INFORMATION

8. Preliminary requirements

Knowledge of operations on real numbers and algebraic expressions, based on the high school mathematics curriculum.

9. Course objectives

C1 Master the calculus of sentences and rules of deduction.

C2 Master the notion of relations on the Cartesian product of sets.

C3 Master the matrix calculus and its applications.

10. Field-specific learning outcomes in terms of knowledge, skills and social competences

A student who completed the course:	reference to field-specific learning outcomes
KNOWLEDGE	
EU01 Knows and understands the concepts of matrices, systems of equations and selected issues of logic and multiplicity theory useful for formulating and solving simple tasks related to the subject matter.	K_W01
EU02 Knows and understands methods, techniques and tools used in solving typical tasks connected with the subject matter.	K_W01
SKILLS	
EU03 Is able to use the methods known from the lectures to formulate and solve tasks	K_U04
EU04 Is able to interpret the obtained results and draw correct conclusions	K_U04
SOCIAL COMPETENCES	
EU05 Is ready for continuous learning - improving own competences.	K_K01

11. Course content

Course delivery method – lectures/classes/laboratories/practical classes etc.

Lecture:
  1) Sentence calculus. Sentence-forming functors.
  2) Laws of sentence calculus. Rules of reasoning.
  3) Sentence functions of one and many variables
  4) Calculus of quantifiers.

5) Operations on sets and their properties. Cartesian product.
6) The notion of relation. Equivalence relation, classes of abstraction.
7) Relation of partial and linear order. Smallest, largest, minimum and maximum element.
8) Functions and their basic properties. Bijection. Inverse function. Images and counter images.
9) Matrices. Determinants and their properties.
10) Systems of linear equations, Cramer's formulae.
11) Inverse matrix. Operations on matrices.
12) Row of matrices. Kronecker-Capelli system.

Classes:
1) Tasks checking the correctness of logical formulas.
2) Tasks checking the correctness of the rules of inference.
3) Tasks checking the correctness of the use of quantifiers.
4) Examples of relations.
5) Determination of equivalence classes.
6) Testing the properties of ordering relations.
7) Determination of distinguished elements.
8) Determination of images and counter-images determined by functions.
9) Operations on matrices.
10) Calculating values of determinants.
11) Solving systems of equations by Cramer's method.
12) Calculating inverse matrices.
13) Calculating the order of matrices.

12. Teaching tools and methods
1. Lecture in the form of a presentation
2. Board, chalk, projector, computer
3.Explanation and a multimedia presentation

13. Assessment method(component, final)
1. Test
2. Evaluation of class participation
3. Examination

14. Student workload	
Form of activity	Number of hours
1. Classes with direct participation of the teacher and office hours	70
2.Student workload	5
SUM	75
NUMBER OF ECTS CREDITS	3

15. Reference books

Primary:

1) H. Rasiowa, Wstęp do matematyki współczesnej, PWN, Warszawa 2003 lub nowsze

2) K. A. Ross, Ch. R. B. Wright, Matematyka dyskretna, PWN, Warszawa 1996 lub nowsze

3) W. Marek, J. Onyszkiewicz, Elementy logiki i teorii mnogości w zadaniach, PWN, Warszawa 1972 lub nowsze

4) T. Jurlewicz, Z. Skoczylas, Algebra liniowa, cz.1, cz.2, GIS Wrocław 2002 lub nowsza

5) T. Jurlewicz, Z. Skoczylas, Algebra liniowa, przykłady i zadania, GIS Wrocław 2002 lub nowsza

Secondary:

1)	A. Tarski, O logice matematycznej i metodzie dedukcyjnej, Książnica Atlas, Lwów-Warszawa, 1936
2)	A. Płocki, Matematyka ogólna, PWSZ w N. Sączu, 2003
3)	A. Kostrykin, Wstęp do algebry, PWN, Warszawa 2004 lub nowsza
4)	A. Kostrykin, Zbiór zadań z algebry, PWN, Warszawa 2005 lub nowsza

16. Assessment form - details

Conditions for obtaining the course credit: the course ends with a written exam

Classes

Three written tests checking student's knowledge and skills

Duration 45 minutes

The condition to obtain a positive grade from each test is to obtain at least 50% of points.

Scoring:

0 - 49% - insufficient (2,0)

50%-59% sufficient (3.0)

60%-69% sufficient plus (3.5)

70% - 79% good (4.0)

80% - 89% good plus (4.5)

90%-100% very good (5.0)

A student receives a passing grade if they receive at least a sufficient grade from each test and show 85% attendance in class. The student may receive a higher mark if he/she actively participates in the classes.

Written examination

Time 90 minutes

4-5 tasks to be solved

Marking as above

17. Other details concerning thecourse

1. Direct information about the issues of classes and a program content is provided by the teacher during classes and during office hours.
2. Classes will be held at AB in Biała Podlaska
3. Classes will be held in accordance with the current schedule
4. Office hours will be held in accordance with the applicable schedule