

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KMAT/Ma-BD103A/22	Course title: Algebra 1
Type and range of planned learning activities and teaching methods: Form of instruction: Lecture / Seminar Recommended study range: hours weekly: 2 / 2 hours per semester: 26 / 26 Teaching method: on-site	
Credits: 4	Working load: 100 hours
Recommended semester/trimester: 2.	
Level of study: I.	
Prerequisites: KMAT/Ma-BD101A/22	
Requirements for passing the course: During the semester, students will be given weekly homework assignments and will write short papers - flashcards; the condition for participation in the exam is to score at least half of the total points for the flashcards. The exam consists of both written and oral parts. Course evaluation: A - 100 % - 93 %, B - 92 % - 85 %, C - 84 % - 77 %, D - 76 % - 69 %, E - 68 % - 60 %, Fx - 59 % - 0 %	
Learning outcomes of the course: Students will gain a solid understanding of the basic concepts of algebraic structures with one and two operations, in particular groups and rings, with particular reference to applications in school mathematics. Students will become familiar with the divisibility of integers, the central position of polynomials in mathematics, their divisibility, roots, important properties, and their relationship to other parts of mathematics. Students will learn how to prove mathematical theorems, apply them, and solve problems in the subject area. Referring to the matrix of objectives and learning outcomes, upon completion of the course, students will have the following knowledge, skills, and competencies: V4 He/she has basic knowledge of mathematical analysis, algebra, geometry, school stochastics and didactics of mathematics as the foundations of the profession of mathematics teacher. Z2 He/she is able to think and argue critically. Z3 He/she is able to estimate the strengths and weaknesses of things, to carry out mental experiments. K4 He/she does not trust cheap and quick solutions to difficult problems. K5 He/she is interested in what is going on in society, willing to work on oneself, enjoys solving problems, views phenomena of various kinds (natural, social, economic) with a reasonable distance.	
Course contents: 1. Binary operations on a set, commutativity, associativity, distributivity, neutral element, inverse elements. 2. Structures with one operation, groups, subgroups, morphisms of groups. 3. Structures with two operations, circuits, integrity scopes, bodies, fields, isomorphism of circuits.	

4. Polynomials, divisibility of polynomials, Division theorem with remainder, decomposition of polynomials into product of irreducible elements.
5. Roots of polynomials, Multiple roots, Fundamental theorem of algebra.
6. Viet's relations, rational roots, Necessary condition for the existence of rational roots.
7. Roots and reducibility of polynomials in $\mathbb{Z}[x]$, $\mathbb{Q}[x]$, $\mathbb{R}[x]$, $\mathbb{C}[x]$.

Recommended or required literature:

1. Katriňák, T. a kol.: Algebra a teoretická aritmetika 1. Alfa, Bratislava 1985.
2. Chvál, V., Mikola, M.: Algebra. ŽU, Žilina 1999.
3. McLane S., Birkhoff G.: Algebra. Alfa, Bratislava 1973.
4. Šalát T. a kol.: Algebra a teoretická aritmetika 2. Alfa, Bratislava 1986.

Language of instruction:

Slovak

Notes:

Course evaluation:

Assessed students in total: 16

A	B	C	D	E	FX
18.75	31.25	25.0	12.5	0.0	12.5

Name of lecturer(s): prof. RNDr. Miroslav Haviar, CSc.

Last modification: 29.08.2022

Supervisor(s):

Guarantor:

Administrátor Systému

People responsible for the delivery, development and quality of the study programme:

prof. ThDr. Rastislav Adamko, PhD., doc. Mgr. Marek Babic, PhD., doc. RNDr. Pavel Bella, PhD., prof. PaedDr. Mgr. art. Rastislav Biarinec, ArtD., prof. Irina Chelysheva, DrSc., prof. PaedDr. František Dlugoš, PhD., Mgr. Juraj Dvorský, PhD., prof. PhDr. Ingrid Emmerová, PhD., doc. Tatiana Korenkova, CSc., prof. PaedDr. Milan Ligoš, CSc., doc. Mgr. Eva Litavcová, PhD., doc. PaedDr. Peter Mačura, PhD., prof. PhDr. David Papajík, PhD., doc. Ing. Miroslav Saniga, CSc., prof. Nóra Séllei, PhD., DrSc., PhDr. ThLic. Martin Taraj, PhD., Prof. Ing. Peter Tomčík, PhD., prof. Dr. phil. fac. theol. Peter Volek, doc. Ing. Igor Černák, PhD.