



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS						
Predmet:	Algebra					
Course title:	Algebra					
Študijski program in stopnja Study programme and level	Študijska smer Study field			Letnik Academic year	Semester Semester	
Matematika				2.	3.	
Mathematics				2.	3.	
Vrsta predmeta / Course type						
Univerzitetna koda predmeta / University course code:						
Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
60		45			135	8
Nosilec predmeta / Lecturer: Dušan PAGON						
Jeziki / Languages:						
		Predavanja / Lectures:	SLOVENSKO/SLOVENE			
		Vaje / Tutorial:	SLOVENSKO/SLOVENE			
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:				Prerequisites:		
Ne				None		
Vsebina:				Content (Syllabus outline):		
Številске množice kot algebrske strukture. Polinomi ene spremenljivke, algebraične enačbe. Polinomi več spremenljivk. Polgrupe, grupe in podgrupe. Red elementa, ciklična grupa. Simetrična grupa. Podgrupe edinke in faktorske grupe. Homomorfizmi grup. Kolobarji, definicija in primeri. Podkolobar, ideal in faktorski kolobar. Homomorfizmi kolobarjev. Cel kolobar, obseg ulomkov. Glavni kolobarji. Kolobarji z enolično faktorizacijo. Polje. Algebraični in transcendentni elementi, razširitve polja. Konstruktibilna števila.				Sets of numbers as algebraical structures. Polynomials in one variable, algebraic equations. Polynomials of several variables. Semigroups, groups and subgroups. Order of an element, cyclic group. Symetric group. Normal subgroups and factor groups. Homomorphisms of groups. Rings, definition and examples. Subring, ideal and factor ring. Homomorphisms of rings. Integral domain, its field of fractions. Principal rings. Rings with unique factorisation. Field. Algebraic and transcendental elements, field extensions. Constructible numbers.		

Temeljna literatura in viri / Readings:		
W. Y. Gilbert, W. K. Nicholson, Modern Algebra with Applications, Wiley, Chichester 2004 S. Lang, Undergraduate Algebra, Springer, 2005 A. I. Kostrikin, Introduction to Algebra, Springer-Verlag, New York 1982 I. Vidav, Algebra, DMFA, Ljubljana 1980		
Cilji in kompetence:	Objectives and competences:	
Študentje spoznajo osnovne algebrske strukture skupaj s spremljajočimi pojmi kot so podstruktura, homomorfizem, kvocientna struktura.	The students get familiar with the main algebraic structures including such related topics as substructure, homomorphism and factorstructure.	
Predvideni študijski rezultati:	Intended learning outcomes:	
Znanje in razumevanje: <ul style="list-style-type: none"> Razumevanje pojmov algebrske strukture, njene podstrukture in izomorfnih struktur. Poznavanje osnovnih značilnosti ter tipičnih primerov grup in kolobarjev. Prenesljive/ključne spretnosti in drugi atributi: <ul style="list-style-type: none"> Pridobljena znanja so podlaga za večino predmetov v nadaljevanju študija. 	Knowledge and Understanding: <ul style="list-style-type: none"> The notion of an algebraic structure, its substructure and isomorphic structures. To recognize the typical properties and main examples of groups and rings. Transferable/Key Skills and other attributes: <ul style="list-style-type: none"> The obtained knowledge is a basis for most of the later subjects. 	
Metode poučevanja in učenja:	Learning and teaching methods:	
<ul style="list-style-type: none"> Predavanja Teoretične vaje 	<ul style="list-style-type: none"> Lectures Theoretical exercises 	
Načini ocenjevanja:	Assessment:	
Način (pisni izpit, ustno izpraševanje, naloge, projekt) Pisni izpit – praktični del Ustni izpit – teoretični del Pisni izpit – praktični del se lahko nadomesti z dvema delnima testoma (sprotni obveznosti).	Delež (v %) / Weight (in %) 50% 50%	Type (examination, oral, coursework, project): Written exam – practical part Oral exam – theoretical part Written exam – practical part can be replaced by two partial tests (mid-term testing).
Reference nosilca / Lecturer's references:		
<p>1. PAGON, Dušan, REPOVŠ, Dušan, ZAICEV, Mikhail. On the codimension growth of simple color Lie superalgebras. <i>J. Lie theory</i>, 2012, vol. 22, no. 2, str. 465-479. http://www.heldermann.de/JLT/JLT22/JLT222/jlt22017.htm. [COBISS.SI-ID 16070233]</p> <p>2. PAGON, Dušan. Simplified square equation in the quaternion algebra. <i>International journal of pure and applied mathematics</i>, 2010, vol. 61, no. 2, str. 231-240. [COBISS.SI-ID 17718024]</p>		

3. GUTIK, Oleg, PAGON, Dušan, REPOVŠ, Dušan. On chains in H-closed topological pospaces. *Order (Dordr.)*, 2010, vol. 27, no. 1, str. 69-81. <http://dx.doi.org/10.1007/s11083-010-9140-x>. [COBISS.SI-ID [15502169](#)]
4. GUTIK, Oleg, PAGON, Dušan, REPOVŠ, Dušan. The continuity of the inversion and the structure of maximal subgroups in countably compact topological semigroups. *Acta math. Hung.*, 2009, vol. 124, no. 3, str. 201-214. <http://dx.doi.org/10.1007/s10474-009-8144-8>, doi: [10.1007/s10474-009-8144-8](https://doi.org/10.1007/s10474-009-8144-8). [COBISS.SI-ID [15212121](#)]
5. PAGON, Dušan. The dynamics of selfsimilar sets generated by multibranching trees. *International journal of computational and numerical analysis and applications*, 2004, vol. 6, no. 1, str. 65-76. [COBISS.SI-ID [14037081](#)]