Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS			
Predmet:	**Algebra I**		
Course title:	Algebra I		
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:	**Prerequisits:**
Jih ni.	There are none.
Vsebina:	**Content (Syllabus outline):**
Številske 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. Delovanje grupe na množico, orbita in stacionarna podgrupa elementa. Sylowske podgrupe in izreki Sylowa. Opis končnih Abelovih grup. Neizomorfne neabelove grupe z manj kot 16 elementi.	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. Symmetric group. Normal subgroups and factor groups. Homomorphisms of groups. Action of a group on a set, orbit and stabilizer of an element. Sylow subgroups and teorems of Sylow. The classification of finite Abelian groups. Non-isomorphic nonabelian groups of order less then 16.

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: • Razumevanje pojmov algebrske strukture, njene podstrukture in izomorfnih struktur. • Poznavanje osnovnih značilnosti ter tipičnih primerov grup. Prenesljive/ključne spretnosti in drugi atributi: • Pridobljena znanja so podlaga za večino predmetov v nadaljevanju študija.	Knowledge and Understanding: • The notion of an algebraic structure, its substructure and isomorphic structures. • To recognize the typical properties and main examples of groups. Transferable/Key Skills and other attributes: • The obtained knowledge is a basis for most of the later subjects.
Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanja • Teoretične vaje	• Lectures • Theoretical exercises
Načini ocenjevanja:	**Assessment:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt)	Delež (v %) / Weight (in %)	Type (examination, oral, coursework, project):
Pisni izpit – praktični del Ustni izpit – teoretični del Pisni izpit – praktični del se lahko nadomesti z dvema delnima testoma (sprotni obveznosti).	50% 50%	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:

1. MENCINGER, Matej, FERČEC, Brigita, OLIVEIRA, Regilene, PAGON, Dušan. Cyclicity of some analytic maps. Applied mathematics and computation, ISSN 0096-3003. [Print ed.], February 2017, vol. 295, str. 114-125. http://www.sciencedirect.com/science/article/pii/S0096300316305963, doi: 10.1016/j.amc.2016.09.026.

2. ALI, Shakir, DAR, Nadeem Ahmad, PAGON, Dušan. On Jordan *-mappings in rings with

involution. Journal of the Egyptian Mathematical Society (Print), ISSN 1110-256X, Jan. 2016, vol. 24, iss. 1, str. 15-19, doi: 10.1016/j.joems.2014.12.006.

3. MASLOVA, Natalia Vladimirovna, PAGON, Dušan. On the realizability of a graph as the Gruenberg-Kegel graph of a finite group. Sibirskie èlektronnye matematičeskie izvestiâ, ISSN 1813-3304, 2016, vol. 13, str. 89-100, doi: 10.17377/semi.2016.13.007.

4. PAGON, Dušan, REPOVŠ, Dušan, ZAICEV, Mikhail. Group gradings on finite dimensional Lie algebras. Algebra colloquium, ISSN 1005-3867, 2013, vol. 20, no. 4, str. 573578. http://www.worldscientific.com/doi/abs/10.1142/S1005386713000540.

5. PAGON, Dušan. On zeros of univariate polynomials over the quaternion algebra. Cayley journal of mathematics, 2013, vol. 2, no. 1, str. 27-45. http://www.domainsmoon.com/cjm/cjmfiles/cjm2013.html.