

UČNI NAČRT PREDMETA / COURSE SYLLABUS						
Predmet:		Izbrana poglavja iz algebre				
Course title:		Topics in algebra				
Študijski program in stopnja Study programme and level		Študijska smer Study field		Letnik Academic year	Semester Semester	
Magistrski študijski program Matematika		ni smeri		1 ali 2	prvi ali drugi	
Master's study programme Mathematics		none		1 or 2	first or second	
Vrsta predmeta / Course type				izbirni		
Univerzitetna koda predmeta / University course code:				M2224		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
45		30			105	6
Nosilec predmeta / Lecturer:		prof. Igor Klep, prof. Jakob Cimprič, prof. Matej Brešar, prof. Peter Šemrl, prof. Primož Moravec				
Jeziki / Languages:		Predavanja / Lectures: slovenski/Slovene, angleški/English				
		Vaje / Tutorial: slovenski/Slovene, angleški/English				
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:				Prerequisites:		
Vsebina:				Content (Syllabus outline):		

<p>Izbrane bodo nekatere standardne teme iz algebre. Možna poglavja so teorija grup, komutativna algebra, nekomutativna algebra, linearna algebra, Liejeve in druge neasociativne algebre, homološka algebra, urejene algebrske strukture itd.</p>	<p>The content consists of a selection of standard topics in algebra. Possible themes include group theory, commutative algebra, noncommutative algebra, linear algebra, Lie and other nonassociative algebras, homological algebra, ordered algebraic structures etc.</p>
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Temeljni literatura in viri / Readings:

<p>I. M. Isaacs, Algebra: A Graduate Course, AMS, 1994.</p> <p>T. W. Hungerford, Algebra, Springer, 1974.</p> <p>S. Lang, Algebra, Springer, 2002.</p> <p>L. H. Rowen: Graduate Algebra: Noncommutative View, AMS, 2008.</p> <p>J. J. Rotman, Advanced modern algebra, AMS, 2010.</p>

Cilji in kompetence:

<p>Namen predmeta je seznaniti študente z nekaterimi pomembnimi temami algebre.</p>

Objectives and competences:

<p>The main goal of the course is to provide students with some important topics in algebra.</p>
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Predvideni študijski rezultati:

<p>Znanje in razumevanje predstavljenih konceptov. Sposobnost uporabe pridobljenega znanja in spretnosti.</p>

Intended learning outcomes:

<p>Knowledge and comprehension of presented concepts. Ability to use acquired knowledge and skills.</p>

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Metode poučevanja in učenja:

Predavanja, konzultacije, reševanje problemov

Learning and teaching methods:

Lectures, consultations, problem sessions

Načini ocenjevanja:

Pisni izpit (domače naloge), ustni izpit

Ocene: 5 (negativno), 6-10 (pozitivno)

Delež (v %) /
Weight (in %)

100%

Assessment:

Written exam (homeworks), oral exam

Grading: 5 (fail), 6-10 (pass)

Reference nosilca / Lecturer's references:

Matej Brešar:

- BREŠAR, Matej, ŠPENKO, Špela. Functional identities of one variable. Journal of algebra, ISSN 0021-8693, 2014, vol. 401, str. 234-244 [COBISS.SI-ID 16842329]
- BREŠAR, Matej. Introduction to noncommutative algebra, (Universitext). Cham [etc.]: Springer, cop. 2014. XXXVII, 199 str. ISBN 978-3-319-08692-7. ISBN 978-3-319-08693-4 [COBISS.SI-ID 17143897]
- BREŠAR, Matej. Algebras in which non-scalar elements have small centralizers. Linear and Multilinear Algebra, ISSN 0308-1087, 2015, vol. 63, no. 9, str. 1864-1871 [COBISS.SI-ID 17160537]

Jakob Cimprič:

- CIMPRIČ, Jaka. A Real Nullstellensatz for free modules. Journal of algebra, ISSN 0021-8693, 2013, vol. 396, str. 143-150 [COBISS.SI-ID 16912729]
- CIMPRIČ, Jaka, SAVCHUK, Yurii, SCHMÜDGEN, Konrad. On q-normal operators and the quantum complex plane. Transactions of the American Mathematical Society, ISSN 0002-9947, 2014, vol.

366, no. 1, str. 135-158 [COBISS.SI-ID 16921177]

Igor Klep:

HELTON, J. William, KLEP, Igor, VOLČIČ, Jurij. Geometry of free loci and factorization of noncommutative polynomials. *Advances in mathematics*, ISSN 0001-8708, June 2018, vol. 331, str. 589-626. <https://doi.org/10.1016/j.aim.2018.04.007>, doi: 10.1016/j.aim.2018.04.007. [COBISS.SI-ID 18416217]

KLEP, Igor, ŠPENKO, Špela, VOLČIČ, Jurij. Positive trace polynomials and the universal Procesi-Schacher conjecture. *Proceedings of the London Mathematical Society*, ISSN 0024-6115, Dec. 2018, vol. 117, iss. 6, str. 1101-1134. <https://doi.org/10.1112/plms.12156>, doi: 10.1112/plms.12156. [COBISS.SI-ID 18564185]

HELTON, J. William, KLEP, Igor, MCCULLOUGH, Scott. The tracial Hahn-Banach theorem, polar duals, matrix convex sets, and projections of free spectrahedra. *Journal of the European Mathematical Society*, ISSN 1435-9855, 2017, vol. 19, iss. 6, str. 1845-1897. <http://dx.doi.org/10.4171/JEMS/707>, doi: 10.4171/JEMS/707. [COBISS.SI-ID 18057817]

Primož Moravec:

– MORAVEC, Primož. Unramified Brauer groups of finite and infinite groups. *American journal of mathematics*, ISSN 0002-9327, 2012, vol. 134, no. 6, str. 1679-1704 [COBISS.SI-ID 16521305]

– DELIZIA, Constantino, MORAVEC, Primož, NICOTERA, Chiara. Groups with all centralizers subnormal of defect at most two. *Journal of algebra*, ISSN 0021-8693, 2013, vol. 374, str. 132-140 [COBISS.SI-ID 16556889]

– JEZERNIK, Urban, MORAVEC, Primož. Bogomolov multipliers of groups of order 128. *Experimental mathematics*, ISSN 1058-6458, 2014, vol. 23, iss. 2, str. 174-180 [COBISS.SI-ID 17109593]

Peter Šemrl:

– ŠEMRL, Peter. The optimal version of Hua's fundamental theorem of geometry of rectangular matrices. *Memoirs of the American Mathematical Society*, ISSN 0065-9266, 2014, vol. 232, no. 1089, str. 1-74 [COBISS.SI-ID 16947545]

– ŠEMRL, Peter. Invertibility preservers on central simple algebras. *Journal of algebra*, ISSN 0021-8693, 2014, vol. 408, str. 42-60 [COBISS.SI-ID 16962649]

