

| UČNI NAČRT PREDMETA / COURSE SYLLABUS  |                               |  |                              |                                    |                                      |             |
|--|-------------------------------|--|------------------------------|------------------------------------|--------------------------------------|-------------|
| <b>Predmet:</b>  |                               | Izbrana poglavja iz algebre  |                              |                                    |                                      |             |
| <b>Course title:</b>   |                               | Topics in algebra  |                              |                                    |                                      |             |
| <b>Študijski program in stopnja</b><br>Study programme and level             |                               | <b>Študijska smer</b><br>Study field   |                              | <b>Letnik</b><br>Academic year     | <b>Semester</b><br>Semester          |             |
| 3MaFi  |                               | Matematika   |                              | 1 ali 2                            | prvi ali drugi                       |             |
| 3MaFi  |                               | Mathematics  |                              | 1 or 2                             | first or second                      |             |
| <b>Vrsta predmeta / Course type</b>  |                               |  |                              | izbirni                            |                                      |             |
| <b>Univerzitetna koda predmeta / University course code:</b>                 |                               |  |                              | M3121                              |                                      |             |
| <b>Predavanja</b><br>Lectures  | <b>Seminar</b><br>Seminar     | <b>Vaje</b><br>Tutorial  | <b>Klinične vaje</b><br>work | <b>Druge oblike študija</b>        | <b>Samost. delo</b><br>Individ. work | <b>ECTS</b> |
| 30   |                               |  |                              |                                    | 150                                  | 6           |
| <b>Nosilec predmeta / Lecturer:</b>  |                               | prof. Jakob Cimprič, prof. Matej Brešar, prof. Peter Šemrl, prof. Primož Moravec |                              |                                    |                                      |             |
| <b>Jeziki / Languages:</b>   | <b>Predavanja / Lectures:</b> | slovenski/Slovene, angleški/English  |                              |                                    |                                      |             |
|  | <b>Vaje / Tutorial:</b>       | slovenski/Slovene, angleški/English  |                              |                                    |                                      |             |
| <b>Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:</b> |                               |  |                              | <b>Prerequisites:</b>              |                                      |             |
|  |                               |  |                              |                                    |                                      |             |
| <b>Vsebina:</b>  |                               |  |                              | <b>Content (Syllabus outline):</b> |                                      |             |
|  |                               |  |                              |                                    |                                      |             |

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| <p>Izbrane bodo nekatere standardne teme iz algebre. Možna poglavja so teorija grup, komutativna algebra, nekomutativna algebra, linearna algebra, Liejeve in druge neasociativne algebre, univerzalna algebra, urejene algebrske strukture itd.</p> <p>Izbira je lahko odvisna od interesov in raziskovalne usmeritve študentov.</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, universal algebra, ordered algebraic structures etc.</p> <p>The choice may depend on students' research interests.</p> |
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**Temeljni literatura in viri / Readings:**

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|---|
| <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> |
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**Cilji in kompetence:**

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| <p>Namen predmeta je seznaniti študente z nekaterimi pomembnimi temami algebre.</p> |
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**Objectives and competences:**

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| <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:**

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| <p>Znanje in razumevanje predstavljenih konceptov.</p> <p>Sposobnost uporabe pridobljenega znanja in spretnosti.</p> |
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**Intended learning outcomes:**

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| <p>Knowledge and comprehension of presented concepts.</p> <p>Ability to use acquired knowledge and skills.</p> |
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**Metode poučevanja in učenja:**

**Learning and teaching methods:**

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| Predavanja, konzultacije, reševanje problemov | Lectures, consultations, problem sessions |
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Delež (v %) /

**Načini ocenjevanja:**

Weight (in %)

**Assessment:**

|  |       |   |
|--|-------|---|
| Pisni izpit (domače naloge), ustni izpit<br>Ocene: 1-5 (negativno), 6-10 (pozitivno) | 100 % | Written exam (homeworks), oral exam<br>Grading: 1-5 (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]

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]