## UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2016/17)

| Predmet: | Urejenostne algebrske strukture |
|---|---|
| Course title: | Ordered algebraic structures |

| Študijski program in stopnja<br>Study programme and level | Študijska smer<br>Study field | Letnik<br>Academic year | Semester<br>Semester |
|---|---|---|---|
| Magistrski študijski program<br>Finančna matematika | ni smeri | 1 ali 2 | prvi ali drugi |
| Master's study programme<br>Financial Mathematics | none | 1 or 2 | first or second |

| Vrsta predmeta / Course type | izbirni / elective |
|---|---|

| Univerzitetna koda predmeta / University course code: | M2217 |
|---|---|

| Predavanja<br>Lectures | Seminar<br>Seminar | Vaje<br>Tutorial | Klinične vaje<br>work | Druge oblike<br>študija | Samost. delo<br>Individ. work | ECTS |
|---|---|---|---|---|---|---|
| 45 | | 30 | | | 105 | 6 |

| Nosilec predmeta / Lecturer: | prof. dr. Jakob Cimprič, prof. dr. Karin Cvetko-Vah, prof. dr. Boris Lavrič |
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| Jeziki /<br>Languages: | Predavanja /<br>Lectures: | slovenski / Slovene, angleški / English |
|---|---|---|
| | Vaje / Tutorial: | slovenski / Slovene, angleški / English |

| Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti: | Prerequisites: |
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| Vpis v letnik študija. | Enrolment in the programme. |

| Vsebina: | Content (Syllabus outline): |
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| | |
|---|---|
| Delno urejene množice. Modulske mreže. Distributivne mreže in njihove upodobitve. Booleove algebre in njihove upodobitve.<br><br>Delno urejene grupe in vektorski prostori. Konveksne podgrupe. Homomorfizmi. Arhimedske in Dedekindovo polne grupe. Linearno urejene grupe.Delno urejeni kolobarji. Ureditve polja ulomkov. Formalno realna polja. Realno zaprta polja. Arhimedske ureditve. Ureditve in valuacije. | Partially ordered sets. Modular lattices. Distributive lattices and their representations. Boolean algebras and their representations.<br>Partially ordered groups and vector spaces. Convex subgroups. Homomorphisms. Archimedean and Dedekind complete groups. Linearly ordered groups.Partially ordered rings. Orderings on the field of fractions. Formally real fields. Real closed fields. Archimedean orderings. Orderings and valuations. |

**Temeljni literatura in viri / Readings:**

G. Birkhoff: Lattice Theory, 3rd edition, AMS, Providence, 2006.

T.S. Blyth: Lattices and Ordered Algebraic Structures, Springer, 2005.

L. Fuchs: Partially Ordered Algebraic Systems, Pergamon Press, London, 1963.

A. M. W. Glass: Partially Ordered Groups, World Scientific, River Edge, 1999.

B. Lavrič: Delno urejene grupe in delno urejeni kolobarji, DMFA-založništvo, Ljubljana, 1993.

B. Lavrič: Delno urejeni vektorski prostori, DMFA-založništvo, Ljubljana, 1995.

| **Cilji in kompetence:** | **Objectives and competences:** |
|---|---|
| Študent spozna osnovne pojme teorije urejenostnih algebrskih struktur. | The student learns the basics of the theory of ordered algebraic structures. |

| **Predvideni študijski rezultati:** | **Intended learning outcomes:** |
|---|---|
| Znanje in razumevanje:<br><br>Razumevanje osnovnih pojmov in izrekov teorije urejenostnih algebrskih struktur ter njihove vloge na nekaterih drugih področjih.<br><br>Uporaba: | Knowledge and understanding:<br><br>Understanding of basic concepts and theorems of the theory of ordered algebraic structures, and their role in some other areas.<br><br>Application: |

| V drugih vejah matematike. | In other mathematical areas. |
|---|---|
| Refleksija: Razumevanje teorije na podlagi primerov in uporabe. | Reflection: |
| | Understanding the theory on the basis of examples and applications. |
| Prenosljive spretnosti – niso vezane le na en predmet: | Transferable skills: |
| Formulacija in reševanje problemov z abstraktnimi metodami. | Formulation and solution of problems using abstract methods. |

**Metode poučevanja in učenja:** | **Learning and teaching methods:**

| Predavanja, vaje, domače naloge, konzultacije. | Lectures, exercises, homeworks, consultations. |
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| **Načini ocenjevanja:** | Delež (v %) / Weight (in %) | **Assessment:** |
|---|---|---|
| Način (pisni izpit, ustno izpraševanje, naloge, projekt): | | Type (examination, oral, coursework, project): |
| domače naloge | | homework assignment |
| ustni izpit | | oral exam |
| Ocene: 1-5 (negativno), 6-10 (pozitivno) (po Statutu UL) | 50% 50% | Grading: 1-5 (fail), 6-10 (pass) (according to the Statute of UL) |

**Reference nosilca / Lecturer's references:**

Jaka Cimprič:

CIMPRIČ, Jaka. Free skew fields have many [ast]-orderings. Journal of algebra, ISSN 0021-8693, 2004, vol. 280, no. 1, str. 20-28. [COBISS.SI-ID 13210201]

CIMPRIČ, Jaka, KLEP, Igor. Generalized orderings and rings of fractions. Algebra universalis, ISSN

0002-5240, 2006, vol. 55, no. 1, str. 93-109. [COBISS.SI-ID 13966937]

CIMPRIČ, Jaka. A representation theorem for archimedean quadratic modules on [star]-rings. Canadian mathematical bulletin, ISSN 0008-4395, 2009, vol. 52, št. 1, str. 39-52. [COBISS.SI-ID 15084633]

Boris Lavrič:

LAVRIČ, Boris. Delno urejeni vektorski prostori, (Podiplomski seminar iz matematike, 22). Ljubljana: Društvo matematikov, fizikov in astronomov Slovenije, 1995. 152 str. ISBN 961-212-049-8. [COBISS.SI-ID 53745152]

LAVRIČ, Boris. Delno urejene grupe in delno urejeni kolobarji, (Podiplomski seminar iz matematike, 21). Ljubljana: Inštitut za matematiko, fiziko in mehaniko: Fakulteta za naravoslovje in tehnologijo: Društvo matematikov, fizikov in astronomov Slovenije, 1993. 134 str. ISBN 961-212-010-2. [COBISS.SI-ID 36205056]

LAVRIČ, Boris. Coherent Archimedean f-rings. Communications in algebra, ISSN 0092-7872, 2000, let. 28, št. 2, str. 1091-1096. [COBISS.SI-ID 9502041]

Karin Cvetko Vah:

CVETKO-VAH, Karin. Internal decompositions of skew lattices. Communications in algebra, ISSN 0092-7872, 2007, vol. 35, no. 1, str. 243-247. [COBISS.SI-ID 14223193]

CVETKO-VAH, Karin. On strongly symmetric skew lattices. Algebra universalis, ISSN 0002-5240, 2011, vol. 66, no. 1-2, str. 99-113. [COBISS.SI-ID 16219993]

BAUER, Andrej, CVETKO-VAH, Karin. Stone duality for skew Boolean algebras with intersections. Houston journal of mathematics, ISSN 0362-1588, 2013, vol. 39, no. 1, str. 73-109. [COBISS.SI-ID 16620377]