



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

| | |
|----------------------|----------------|
| Predmet: | Teorija množic |
| Course title: | Set Theory |

| Študijski program in stopnja Study programme and level | Študijska smer Study field | Letnik Academic year | Semester Semester |
|--|-------------------------------|-------------------------|----------------------|
| Izobraževalna matematika – dvpredmetni, 1. stopnja | | 2. ali 3. | 4., 5., ali 6. |
| Educational mathematics – Double- major, 1 st degree | | 2. or 3. | 4., 5., or 6. |

Vrsta predmeta / Course type Izbirni / Elective

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 |
|------------------------|--------------------|-----------------------|---------------------------------|---------------------------|-------------------------------|------|
| 15 | | 15 | | | 150 | 6 |

Nosilec predmeta / Lecturer: Uroš MILUTINOVIČ

Jeziki / Predavanja / Lectures: SLOVENSKO/SLOVENE
Languages: Vaje / Tutorial: SLOVENSKO/SLOVENE

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti: **Prerequisites:**

Jih ni.

There are none.

Vsebina:
 Osnovni pojmi matematične logike. Načini zapisovanja množic. Osnovne relacije med množicami, osnovne operacije z množicami ali družinami množic. Relacije. Ekvivalenčne relacije. Ureditve. Dobra ureditev. Matematična indukcija. Funkcije. Posebni tipi funkcij.

 Končne in neskončne, števne in neštevne množice.

 Osnovno o kardinalnih in ordinalnih številih.

Content (Syllabus outline):
 The basic notions of mathematical logic. The methods of denoting sets. The basic relations among sets, the basic operations on sets or families of sets. Relations. Equivalence relations. Order. Well order. Mathematical induction. Functions. Special types of functions.

 Finite and infinite, countable and uncountable sets.

 Fundamentals of cardinal and ordinal numbers.

Temeljni literatura in viri / Readings:
 N.Prijatelj: Matematične strukture I, Ljubljana, Društvo matematikov, fizikov in astronomov Slovenije, 1996
 R.R.Stoll: Set theory and logic, New York, Dover Publications, 1979
 S.Lipschutz: Schaum's outline of theory and problems of set theory and related topics, New York (etc.), McGraw-Hill, 1998

Cilji in kompetence: **Objectives and competences:**

Obvladati osnovne pojme in rezultate iz matematične logike in teorije množic.

Students learn how to use the basic notions and results of mathematical logic and set theory.

Predvideni študijski rezultati:

Znanje in razumevanje:

- Uporaba osnovnih pojmov matematične logike (izjava, predikat, logične operacije, kvantifikatorja)
- Uporaba osnovnih pojmov in rezultatov iz teorije množic (množice, operacije z množicami in družinami množic, relacije, funkcije, kardinalna in ordinalna števila).

Prenesljive/ključne spretnosti in drugi atributi:

- Pridobljena znanja so osnova za vse druge matematične predmete.

Intended learning outcomes:

Knowledge and Understanding:

- Be able to use the basic notions of mathematical logic (statements, predicates, logical operations, quantifiers)
- Be able to use the basic notions and results of set theory (sets, operations on sets and families of sets, relations, functions, cardinal and ordinal numbers)

Transferable/Key Skills and other attributes:

- The obtained knowledge forms a foundation for all the other mathematical subjects.

Metode poučevanja in učenja:

- Predavanja
- Teoretične vaje

Learning and teaching methods:

- Lectures
- Theoretical exercises

Načini ocenjevanja:

Assessment:

| Način (pisni izpit, ustno izpraševanje, naloge, projekt) | Delež (v %) / Weight (in %) | Type (examination, oral, coursework, project): |
|---|-----------------------------|---|
| <p><u>Izpit:</u> Pisni izpit – problemi Ustni izpit – teorija</p> <p>Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.</p> <p>Pozitivna ocena pri pisnem izpitu - problemi je pogoj za pristop k ustnemu izpitu – teorija.</p> <p>Pisni izpit – praktični del se lahko izpelje kot sprotna obveznost.</p> | <p>50%</p> <p>50%</p> | <p><u>Exams:</u> Written exam – problems Oral exam – theory</p> <p>Each of the mentioned assessments must be assessed with a passing grade.</p> <p>Passing grade of the written exam – problems is required for taking the oral exam – theory.</p> <p>Written exam – problems can be replaced by one mid-term test.</p> |

Reference nosilca / Lecturer's references:

I. BANIČ, Iztok, ČREPŃJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš, SOVIĆ, Tina. Ważewski's universal

- dendrite as an inverse limit with one set-valued bonding function. *Preprint series*, 2012, vol. 50, št. 1169, str. 1-33. <http://www.imfm.si/preprinti/PDF/01169.pdf>. [COBISS.SI-ID 16194137]
2. BANIČ, Iztok, ČREPNJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš. Paths through inverse limits. *Topol. appl.*. [Print ed.], 2011, vol. 158, iss. 9, str. 1099-1112. <http://dx.doi.org/10.1016/j.topol.2011.03.001>. [COBISS.SI-ID 18474504]
3. BANIČ, Iztok, ČREPNJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš. Limits of inverse limits. *Topol. appl.*. [Print ed.], 2010, vol. 157, iss. 2, str. 439-450. <http://dx.doi.org/10.1016/j.topol.2009.10.002>. [COBISS.SI-ID 15310169]
4. KLAVŽAR, Sandi, MILUTINOVIĆ, Uroš, PETR, Ciril. Stern polynomials. *Adv. appl. math.*, 2007, vol. 39, iss. 1, str. 86-95. <http://dx.doi.org/10.1016/j.aam.2006.01.003>. [COBISS.SI-ID 14276441]
5. IVANŠIĆ, Ivan, MILUTINOVIĆ, Uroš. Closed embeddings into Lipscomb's universal space. *Glas. mat.*, 2007, vol. 42, no. 1, str. 95-108. [COBISS.SI-ID 14338393]