



Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Teorija množic
Course title:	Set Theory

Študijski program in stopnja	Študijska smer	Letnik	Semester
Study programme and level	Study field	Academic year	Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	4.	8.
Five-year master's degree program Subject Teacher	/		

Vrsta predmeta / Course type	Izbirni / Elective
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Univerzitetna koda predmeta / University course code:	
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Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
30	0	30	0	0	30	3

Nosilec predmeta / Lecturer:	Niko Tratnik
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Jeziki / Languages:	Predavanja / Lectures:	slovenski / Slovenian
	Vaje / Tutorial:	slovenski / Slovenian

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

Vsaka izmed naštetih obveznosti v načinih ocenjevanja mora biti opravljena s pozitivno oceno.

Pozitivna ocena pri pisnem izpitu je pogoj za pristop k teoretičnemu izpitu.

Prerequisites:

Each of the mentioned commitments must be assessed with a passing grade.

Passing grade of the written exam is required for taking the theoretical exam.

Vsebina:

Osnovni pojmi matematične logike. Načini zapisovanja množic. Osnovne relacije med množicami, osnovne operacije z množicami ali družinami množic. Relacije. Ekvivalenčne relacije. Funkcije. Posebni tipi funkcij.

Končne in neskončne, števne in neštevne množice.

Kardinalna števila in kardinalna aritmetika.

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. Functions. Special types of functions.

Finite and infinite, countable and uncountable sets.

Cardinal numbers and cardinal arithmetic.

Temeljni literatura in viri / Readings:

1. S. Lipschutz, *Schaum's outline of theory and problems of set theory and related topics*. New York: McGraw-Hill, 1998.
2. N. Prijatelj, *Matematične strukture. 1, Množice, relacije, funkcije*. Ljubljana: DMFA, 1996.
3. R. R. Stoll, *Set theory and logic*. New York: Dover Publications, 1979.

Dodatna literatura / Additional Readings:

1. P. Papić, *Uvod u teoriju skupova*. Zagreb: HMD, 2000.

Cilji in kompetence:

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

Objectives and competences:

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

Predvideni študijski rezultati:

Znanje in razumevanje. Po uspešnem zaključku tega predmeta bodo študentje sposobni:

- Uporabiti osnovne pojme matematične logike (izjava, predikat, logične operacije, kvantifikatorja).
- Razložiti in uporabiti osnovne pojme in rezultate iz teorije množic (množice, operacije z množicami in družinami množic, relacije, funkcije, končne in neskončne množice, števne in neštevne množice, kardinalna števila in kardinalna aritmetika).

Prenesljive/ključne spretnosti in drugi atributi:

- Pridobljena znanja so osnova za vse druge matematične predmete.

Intended learning outcomes:

Knowledge and Understanding. After successful completion of this course the students will be able to:

- Use the basic concepts of mathematical logic (propositions, predicates, logical operations, quantifiers).
- Explain and use the basic concepts and results of set theory (sets, operations on sets and families of sets, relations, functions, finite and infinite sets, countable and uncountable sets, cardinal numbers and cardinal arithmetic).

Transferable/Key Skills and other attributes:

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

	subjects. • •
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Metode poučevanja in učenja:

- Predavanja
- Seminarske vaje
- Individualno delo

Learning and teaching methods:

Lectures
Tutorial
Individual work

Načini ocenjevanja:		Delež (v %) / Weight (in %)	Assessment:
Pisni izpit	50%	Written exam	
Teoretični izpit	50%	Theoretical exam	

Opombe:

Pisni izpit se lahko nadomesti s kolokviji v enakem deležu 50%.

Comments:

Written exam can be replaced by written midterm exams in the weight of 50%.

Reference nosilca / Lecturer's references:

1. BREZOVNIK, Simon, CHE, Zhongyuan, TRATNIK, Niko, ŽIGERT PLETERŠEK, Petra. Resonance graphs of plane bipartite graphs as daisy cubes. *Discrete applied mathematics*. May 2025, vol. 366, str. 75-85. ISSN 0166-218X. <https://www.sciencedirect.com/science/article/pii/S0166218X25000228>, DOI: 10.1016/j.dam.2025.01.017. [COBISS.SI-ID 224635651]
2. BREZOVNIK, Simon, CHE, Zhongyuan, TRATNIK, Niko, ŽIGERT PLETERŠEK, Petra. Outerplane bipartite graphs with isomorphic resonance graphs. *Discrete applied mathematics*. Jan. 2024, vol. 343, str. 340-349. ISSN 0166-218X. <https://www.sciencedirect.com/science/article/pii/S0166218X23004195>, DOI: 10.1016/j.dam.2023.11.006. [COBISS.SI-ID 172545795]
3. TRATNIK, Niko. Zhang-Zhang polynomials of phenylenes and benzenoid graphs. *MATCH Communications in Mathematical and in Computer Chemistry*. 2024, vol. 92, no. 1, str. 25-53. ISSN 3009-4399. https://match.pmf.kg.ac.rs/issues/m92n1/m92n1_25-53.html, DOI: 10.46793/match.92-1.025T. [COBISS.SI-ID 185502723]
4. BREZOVNIK, Simon, DEHMER, Matthias, TRATNIK, Niko, ŽIGERT PLETERŠEK, Petra. Szeged and Mostar root-indices of graphs. *Applied mathematics and computation*. Apr. 2023, vol. 442, [article no.] 127736, 11 str. ISSN 0096-3003.

<https://www.sciencedirect.com/science/article/pii/S0096300322008049>,

DOI: 10.1016/j.amc.2022.127736. [COBISS.SI-ID 139442179]

5. TRATNIK, Niko, YE, Dong. Resonance graphs on perfect matchings of graphs on surfaces. *Graphs and combinatorics*. 2023, vol. 39, iss. 4, [article no.] 68, 15 str. ISSN 0911-0119.

<https://link.springer.com/article/10.1007/s00373-023-02666-4>, DOI: 10.1007/s00373-023-02666-4.

[COBISS.SI-ID 155893507]