



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Teorija števil
Course title:	Number 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	/	2.	4.
Five-year master's degree program Subject Teacher	/		

Vrsta predmeta / Course type

Obvezni / Compulsory

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
45		45			150	8

Nosilec predmeta / Lecturer:

Daniel EREMITA

Jeziki / Predavanja / Lectures: slovenski/Slovene

Languages: Vaje / Tutorial: slovenski/Slovene

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 ustnemu izpitu.

Prerequisites:

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

Passing grade of written exam is required to take the oral exam.

Vsebina:

Deljivost celih števil. Največji skupni delitelj. Evklidov algoritem. Najmanjši skupni večkratnik. Linearne diofantske enačbe.

Praštevila. Osnovni izrek aritmetike.

Kongruence. Kriteriji deljivosti. Linearne kongruence. Kitajski izrek o ostankih. Reševanje polinomskih kongruenc. Wilsonov izrek. Fermatov mali izrek in psevdopraštevila. Eulerjev izrek.

Aritmetične funkcije. Multiplikativne funkcije. Möbiusova formula inverzije.

Red celega števila in primitivni koreni. Kvadratični zakon recipročnosti.

Pitagorejske trojke.

Content (Syllabus outline):

Divisibility of integers. Greatest common divisor. Euclidean algorithm. Least common multiple. Linear Diophantine equations.

Primes. Fundamental Theorem of Arithmetic.

Congruences. Special divisibility tests. Linear congruences. Chinese Remainder Theorem. Solving polynomial congruences. Wilson's Theorem. Fermat's Little Theorem and pseudoprimes. Euler's Theorem.

Arithmetic functions. Multiplicative functions. Möbius inversion.

The Order of an Integer and Primitive roots. The law of quadratic reciprocity.

Pythagorean Triples.

Temeljni literatura in viri / Readings:

D. M. Burton: Elementary Number Theory. New York [etc.] : McGraw-Hill, 1998.

K. H. Rosen: Elementary number theory and its applications. Boston: Pearson/Addison Wesley, cop. 2005.

J. Grasselli: Elementarna teorija števil. Ljubljana: DMFA, 2009.

J. Grasselli: Diofantske enačbe. Ljubljana: DMFA, 1984.

Dodatna literatura / Additional Readings:

A. Dujella: Number Theory. Zagreb: Školska knjiga, 2021.

J. Grasselli: Osnove teorije števil. Ljubljana: DMFA, 1975.

Cilji in kompetence:

Proučiti temeljne koncepte in rezultate elementarne teorije števil.

Objectives and competences:

To study the fundamental concepts and results of elementary number theory.

Predvideni študijski rezultati:

Znanje in razumevanje pojmov in rezultatov elementarne teorije števil.

Intended learning outcomes:

Knowledge and understanding of notions and results of elementary number theory.

Prenesljive/ključne spretnosti in drugi atributi: Pridobljena znanja se dopolnjujejo z znanji s področja algebre, kombinatorike, kriptografije, teorije kodiranja, analize, računalništva, ...	Transferable/Key Skills and other attributes: The obtained knowledge supplements with the knowledge of algebra, combinatorics, cryptography, coding theory, analysis, computer science, ...
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Metode poučevanja in učenja:

- Predavanja
- Seminarske vaje
- Individualno delo

Learning and teaching methods:

- Lectures
- Tutorial
- Individual work

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

Opombe:

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

Comments:

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

Reference nosilca / Lecturer's references:

1. EREMITA, Daniel. Biderivations and commuting linear maps on current Lie algebras. *Journal of Lie theory*. 2021, vol. 31, no. 1, str. 119-126. ISSN 0949-5932.[COBISS.SI-ID [100444419](#)]
2. BENKOVIČ, Dominik, EREMITA, Daniel. Generalized derivations of current Lie algebras. *Communications in algebra*. 2024, vol. 52, iss. 11, str. 4603-4611. ISSN 0092-7872. [COBISS.SI-ID [200554755](#)]
3. EREMITA, Daniel. Dhara, B. (6-BELDC-M); Ghosh, S. (6-JDVP); Sandhu, G. S. (6-PMNC-M): On Lie ideals satisfying certain differential identities in prime rings. (English summary). - Extracta Math. 38 (2023), no. 1, 67–84. *MathSciNet : Mathematical Reviews on the Web*. [Spletna izd.]. 2024, 1 spletni vir (mr4608757). ISSN 2167-5163. [COBISS.SI-ID [200562435](#)]
4. EREMITA, Daniel. Krempa, Jan (PL-WASW-IM): On nil algebras and a problem of Passman concerning nilpotent free algebras. (English summary). - Algebra and coding theory, 197-204, Contemp. Math., 785, Amer. Math. Soc., [Providence], RI, [2023], ©2023. *MathSciNet : Mathematical Reviews on the Web*. [Spletna izd.]. 2024, 1 spletni vir (mr4586441). ISSN 2167-5163. [COBISS.SI-ID [215992579](#)]
5. EREMITA, Daniel. Tiwari, S. K. (6-IITPT-DM): Product and commuting generalized derivations in prime rings. (English summary). - Rend. Circ. Mat. Palermo (2) 72 (2023), no. 2, 1377–

1397. *MathSciNet : Mathematical Reviews on the Web*. [Spletna izd.]. 2024, 1 spletni vir (mr4559105). ISSN 2167-5163. [COBISS.SI-ID [200564227](#)]