

UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18)						
Predmet:		Proseminar B				
Course title:		Introductory seminar B				
Študijski program in stopnja Study programme and level		Študijska smer Study field		Letnik Academic year		Semester Semester
Univerzitetni študijski program Matematika		ni smeri		1		prvi in drugi
First cycle academic study programme Mathematics		none		1		first and second
Vrsta predmeta / Course type				izbirni / elective		
Univerzitetna koda predmeta / University course code:				M0207		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30		60			30	4
Nosilec predmeta / Lecturer:				prof. dr. Matej Brešar, prof. dr. Emil Žagar		
Jeziki / Languages:		Predavanja / Lectures:		slovenski / Slovene		
		Vaje / Tutorial:		slovenski / Slovene		
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:				Prerequisites:		
Vpis v letnik študija.				Enrolment in the programme.		
Vsebina:				Content (Syllabus outline):		

<p>Polinomi: deljivost, Evklidov algoritem, ničle, kubična enačba, osnovni izrek algebre, Sturmov izrek.</p> <p>Geometrija končno razsežnih evklidskih prostorov: izometrije, grupa translacij in grupa rotacij.</p> <p>Metrični prostori: primeri, odprte in zaprte množice, stekališča, kompaktnost, povezanost, polnost. Banachov skrčitveni izrek. Povezava z geometrijo evklidskih prostorov. Heine-Borelov izrek.</p>	<p>Polynomials: divisibility, Euclidean algorithm, roots, cubic equation, fundamental theorem of algebra, Sturm theorem.</p> <p>Geometry of finite dimensional Euclidean spaces: isometries, translation group, and rotation group.</p> <p>Metric spaces: examples, open and closed sets, cluster points, compactness, connectedness, completeness. Banach fixed-point theorem. Relation to the geometry of Euclidean spaces. Heine-Borel theorem.</p>
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Temeljni literatura in viri / Readings:

J. Vrabec: Metrični prostori, DMFA-založništvo, Ljubljana, 1990.

Cilji in kompetence:

Proseminar B dopolnjuje predmeta Analiza 1 in Algebra 1 z nekaterimi dodatnimi vsebinami ter utrjuje razumevanje snovi teh predmetov s konkretnimi primeri.

Objectives and competences:

Proseminar B complements courses Analysis 1 and Algebra 1 with some additional content and strengthens the understanding of these courses by concrete examples.

Predvideni študijski rezultati:

Znanje in razumevanje: Razumevanje obnašanja polinomov, geometrije Evklidskih prostorov ter pojma metričnega prostora.
Uporaba: Uporaba v geometriji, naravoslovju in drugih področjih znanosti.

Refleksija: Razumevanje teorije na podlagi primerov in uporabe.

Prenosljive spretnosti – niso vezane le na en predmet: Postavitve problema, izbira metode, reševanje problema, analiza rezultata na

Intended learning outcomes:

Knowledge and understanding: Understanding the behavior of polynomials, geometry of Euclidean spaces, and the concept of the metric space.

Application: Application in geometry, natural science and other field of science.

Reflection: Understanding of the theory from the applications.

primerih. Formulacija problemov v matematičnem jeziku. Spretnost uporabe literature.

Transferable skills: The ability to design the problem, select an appropriate method, solve the problem, and analyse the results on test cases. The ability to formulate a problem in mathematical language. Skills in using the literature.

Metode poučevanja in učenja:

Predavanja, vaje, domače naloge, konzultacije

Learning and teaching methods:

Lectures, exercises, homework, consultations

Načini ocenjevanja:

Delež (v %) /
Weight (in %)

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):

2 kolokvija namesto izpita iz vaj, izpit iz vaj,

izpit iz teorije

ocene: 1-5 (negativno), 6-10 (pozitivno) (po Statutu UL)

50%

50%

Type (examination, oral, coursework, project):

2 midterm exams instead of written exam, written exam

oral exam

grading: 1-5 (fail), 6-10 (pass) (according to the Statute of UL)

Reference nosilca / Lecturer's references:

Matej Brešar:

BAHTURIN, Jurij Aleksandrovič, BREŠAR, Matej, ŠPENKO, Špela. Lie superautomorphisms on associative algebras, II. Algebras and representation theory, ISSN 1386-923X, 2012, vol. 15, no 3, str. 507-525. [COBISS.SI-ID 16299353]

BREŠAR, Matej. A unified approach to the structure theory of PI-rings and GPI-rings. Serdica mathematical journal, ISSN 1310-6600, 2012, vol. 38, no 1-3, str. 199-210. [COBISS.SI-ID 16355673]

BREŠAR, Matej. Near-derivations in Lie algebras. Journal of algebra, ISSN 0021-8693, 2008, vol. 320, no. 10, str. 3765-3772. [COBISS.SI-ID 14945113]

Emil Žagar:

JAKLIČ, Gašper, KOZAK, Jernej, KRAJNC, Marjetka, VITRIH, Vito, ŽAGAR, Emil. Hermite geometric interpolation by rational Bézier spatial curves. SIAM journal on numerical analysis, ISSN 0036-1429, 2012, vol. 50, no. 5, str. 2695-2715. [COBISS.SI-ID 16449369]

JAKLIČ, Gašper, VITRIH, Vito, ŽAGAR, Emil. Closed form formula for the number of restricted compositions. Bulletin of the Australian Mathematical Society, ISSN 0004-9727, 2010, vol. 81, iss. 2, str. 289-297. [COBISS.SI-ID 15540569]

KOZAK, Jernej, ŽAGAR, Emil. On geometric interpolation by polynomial curves. SIAM journal on numerical analysis, ISSN 0036-1429, 2004, vol. 42, no. 3, str. 953-967. [COBISS.SI-ID 13398617]