UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	Algebra 2
Course title:	Algebra 2

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Univerzitetni študijski program Matematika	ni smeri	2	prvi in drugi
First cycle academic study programme Mathematics	none	2	first and second

Vrsta predmeta / Course type	obvezni

Univerzitetna koda predmeta / University course code:	M0263

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work		ECTS
60		60			180		10

Nosilec predmeta / Lecturer:	prof. Matej Brešar

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski/Slovene
	Vaje / Tutorial:	slovenski/Slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Opravljen predmet Algebra 1.	Completed course Algebra 1.

Vsebina:	**Content (Syllabus outline):**

Grupe: dvojiške operacije, polgrupe, monoidi in grupe: osnovne lastnosti in primeri, podgrupe in odseki, homomorfizmi, edinke in kvocientne grupe, uvod v strukturno teorijo grup, končne Abelove grupe. Kolobarji: osnovne lastnosti in primeri, homomorfizmi, ideali in kvocientni kolobarji, polje ulomkov, glavni kolobarji, kolobarji polinomov ene in več spremenljivk. Komutativni obsegi (polja): končne razširitve, algebraični in transcendentni elementi ter razširitve, konstruktibilna števila, razpadna polja, algebraično zaprta polja, končna polja.	Groups: binary operations, semigroups, monoids, and groups: basic properties and examples, subgroups and cosets, homomorphisms, normal subgroups and quotient groups, introduction to the structure theory of groups, finite abelian groups. Rings: basic properties and examples, homomorphisms, ideals and quotients rings, field of fractions, principal ideal domains, rings of polynomials in one and several variables. Fields: finite extensions, algebraic and transcendental elements and extensions, constructible numbers, splitting fields, algebraically closed fields, finite fields.

Temeljni literatura in viri / Readings:

Vidav: Algebra, DMFA-založništvo, Ljubljana, 2003.

J. Gallian: Contemporary Abstract Algebra, Brooks/Cole, 2013.

I. N. Herstein: Abstract Algebra, John Wiley &; Sons, 1999.

S. Lang: Undergraduate Algebra, Springer, 2005.

L. H. Rowen: Algebra. Groups, rings, and fields. A K Peters, 1994.

Cilji in kompetence: / Objectives and competences:

Cilji in kompetence:	Objectives and competences:
Študent spozna osnovne pojme iz algebre, ki jih potrebuje pri nadaljnjem študiju matematike. Ob tem se uči abstraktnega načina razmišljanja in se spoznava s strogim matematičnim jezikom. Na vajah si pridobiva praktično, delovno znanje z obravnavanega področja.	Students learn basic concepts of algebra that are needed for further study of mathematics. At the same time they learn abstract thinking and rigorous mathematical language. In the tutorial they acquire practical, working knowledge of the area.

Predvideni študijski rezultati: / Intended learning outcomes:

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Znanje in razumevanje: Poznavanje in razumevanje osnovnih algebraičnih pojmov. Uporaba: Uporaba teorije pri reševanju problemov. Refleksija: Razumevanje teorije na podlagi uporabe.	Knowledge and understanding: Knowledge and understanding of basic algebraic concepts. Application: Application of the theory to problem solving. Reflection: Understanding the theory through applications.

Prenosljive spretnosti – niso vezane le na en predmet: Spretnost prenosa teorije v prakso.	Transferable skills: Transfer of theory into practice.

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

Predavanja, vaje, konzultacije	Lectures, exercises, consultations

	Delež (v %) /	

Načini ocenjevanja: Weight (in %)   **Assessment:**

Način (pisni izpit, ustno izpraševanje, naloge, projekt): 3 kolokviji 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): 3 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:

– BREŠAR, Matej, KLEP, Igor. A local-global principle for linear dependence of noncommutative polynomials. Israel journal of mathematics, ISSN 0021-2172, 2013, vol. 193, iss. 1, str. 71-82 [COBISS.SI-ID 16626521]

– BREŠAR, Matej, ŠPENKO, Špela. Functional identities of one variable. Journal of algebra, ISSN 0021-8693, 2014, vol. 401, str. 234-244 [COBISS.SI-ID 16842329]

– BREŠAR, Matej. Introduction to noncommutative algebra, (Universitext). Cham [etc.]: Springer, cop. 2014. XXXVII, 199 str. ISBN 978-3-319-08692-7. ISBN 978-3-319-08693-4 [COBISS.SI-ID 17143897]