UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Algebra
Course title:	Algebra

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Matematika, 3. stopnja		1. ali 2.	1. ali 2. ali 4.
Mathematics, 3rd Degree		1st or 2nd	1st or 2nd or 4th

Vrsta predmeta / Course type | obvezni ali izbirni/obligatory or elective

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
60					240	10

Nosilec predmeta / Lecturer: | Matej Brešar

Jeziki / Languages:	Predavanja / Lectures:	Slovenski in angleški jezik; Slovene and English
	Vaje / Tutorial:	Slovenski in angleški jezik; Slovene and English

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

Prerequisits:

Osnovno poznanje temeljnih algebrskih struktur: grup, vektorskih prostorov, kolobarjev in polj.	Basic knowledge of fundamental algebraic structures: groups, vector spaces, rings and fields.

Vsebina:

Content (Syllabus outline):

Kategorije: osnovni pojmi in primeri. Grupe: osnovna teorija, struktura grup. Moduli: pomembni tipi modulov, verižni pogoji, tenzorski produkti. Komutativna algebra: razširitve polj in Galoisova teorija, komutativni kolobarji. Nekomutativna algebra: osnovna teorija, struktura nekomutativnih kolobarjev in algeber. Neasociativna algebra: osnovni pojmi in primeri. Nekatere izmed teh tem so obdelane podrobneje, druge pa le na osnovni ravni. Pri izboru se upoštevajo interesi in raziskovalne usmeritve študentov.	Categories: basic concepts and examples. Groups: basic theory, the structure of groups. Modules: important types of modules, chain conditions, tensor products. Commutative algebra: field extensions and Galois theory, commutative rings. Noncommutative algebra: basic theory, the structure of noncommutative rings and algebras. Nonassociative algebra: basic concepts and examples. Some of these topics are treated in greater detail,, and some of them only at a basic level. The selection depends on students' interests and their research orientation.

Temeljni literatura in viri / Readings:

- W. A. Adkins, S. H. Weintraub, Algebra. An approach via module theory. Springer-Verlag, 1999.
- Y. Bahturin, Basic structures of modern algebra, Kluwer AP, 1991.
- P. M. Cohn, Basic algebra. Groups, rings and fields, Springer-Verlag, 2003.
- P. A. Grillet, Abstract algebra, Springer-Verlag, 2007.
- T. W. Hungerford, Algebra, Springer-Verlag, 1980.
- I. M. Isaacs, Algebra. A graduate course, Brooks/Cole Publishing Company, 1994.
- A. W. Knapp, Basic algebra, Springer-Verlag, 2006.
- S. Lang, Algebra, Springer-Verlag, 2002.

Cilji in kompetence: / Objectives and competences:

Cilji in kompetence:	Objectives and competences:
• Doseči poglobljeno razumevanje teoretskih in metodoloških konceptov s področja Algebre • Razviti sposobnost samostojnega razvijanja novega znanja s področja Algebre • Razviti sposobnost za samostojno reševanje najzahtevnejših problemov iz Algebre • Razviti sposobnost izboljševanja znanih in odkrivanja novih rezultatov s področja Algebre • Zmožnost razvijanja kritične refleksije na področju Algebre • Razviti zmožnost vodenja najzahtevnejših znanstvenoraziskovalnih projektov s širšega področja Algebre.	• To achieve a deeper understanding of theoretical and methodological concepts of Algebra • To develop the ability to independently develop new knowledge in the field of Algebra • To develop the ability for solving the most challenging problems in Algebra • To develop the ability of improving known results as well as obtaining new results in Algebra • Ability to develop critical reflection in Algebra • To develop the ability to lead the most challenging scientific research projects in the wider field of Algebra

Predvideni študijski rezultati: / Intended learning outcomes:

Predvideni študijski rezultati:	Intended learning outcomes:
Znanje in razumevanje: • poznavanje osnovnih algebrskih področij; • razumevanje osnovnih algebrskih pojmov. Prenesljive/ključne spretnosti in drugi atributi: • podlaga za raziskovalno delo na področju algebre; • pridobljeno znanje za uporabo algebre na drugih matematičnih področjih.	Knowledge and understanding: • knowledge of basic topics in algebra; • understanding fundamental algebraic concepts. Transferable/Key Skills and other attributes: • a basis for research in algebra; • knowledge needed for applying algebra to other mathematical areas.

Metode poučevanja in učenja:	**Learning and teaching methods:**
• predavanja; • priprava seminarja; • konzultacije; • samostojni študij.	• lectures; • seminar work; • consultations; • self-study.

Načini ocenjevanja:

Način (pisni izpit, ustno izpraševanje, naloge, projekt)	Delež (v %) / Weight (in %)	**Assessment:** Type (examination, oral, coursework, project):
Seminar	**20%**	Seminar
Pisni izdelek	**30%**	Written work
Ustni izpit	**50%**	Oral Examination

Reference nosilca / Lecturer's references:

Y. Bahturin, M. Brešar, Š. Špenko, Lie superautomorphisms on associative algebras, II, Algebras Repr. Th. 15 (2012), 507--525.

M. Brešar, Multiplication algebra and maps determined by zero products, Linear Multilinear Algebra 60 (2012), 763--768.

Y. Bahturin, M. Brešar, M. Kochetov, Group gradings on finitary simple Lie algebras, International Journal of Algebra and Computation 22 (2012), 250046.

M. Brešar, I. Klep, A local-global principle for linear dependence of noncommutative polynomials, Israel J. Math. 193 (2013), 71-82.

M. Brešar, Š. Špenko, Functional identities in one variable, J. Algebra 401 (2014), 234-244.