



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS						
Predmet:	Teorija grup					
Course title:	Group Theory					
Študijski program in stopnja Study programme and level	Študijska smer Study field			Letnik Academic year	Semester Semester	
Matematika, 2. stopnja				1. ali 2.	1. ali 3.	
Mathematics, 2 nd cycle				1. or 2.	1. or 3.	
Vrsta predmeta / Course type				Izbirni / elective		
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		30			135	7
Nosilec predmeta / Lecturer:		Mateja GRAŠIČ				
Jeziki / Languages:	Predavanja / Lectures:		SLOVENSKO/SLOVENE			
	Vaje / Tutorial:		SLOVENSKO/SLOVENE			
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:			Prerequisites:			
Ne.			None.			
Vsebina:			Content (Syllabus outline):			
Simetrične grupe. Konjugirani elementi in podgrupe. Delovanje grupe na množico. Linearne grupe: osnovne lastnosti in primeri.			Symetric groups. Conjugated elements and subgroups. The action of a group on a set. Linear groups: main properties and examples.			
Izreki Sylowa. Podajanje grupe z generatorji in relacijami. Direktni produkt grup. Abelove grupe.			Sylow's theorems. Definition of a group by generators and relations. Direct product of groups. Abelian groups.			
Enostavne grupe. Komutant grupe, rešljivost končnih p-grup in grupe zgornje trikotnih matrik.			Simple groups. Derived group, solvability of finite p-groups and the group of upper triangular matrices.			

Upodobitve grup: osnovni pojmi in primeri.	Representations of groups: concepts and examples.
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Temeljni literatura in viri / Readings:

W. Y. Gilbert, W. K. Nicholson, Modern Algebra with Applications, Wiley, Chichester 2004
 S. Lang, Undergraduate Algebra, Springer, 2005
 J. F. Humphreys, A Course in Group Theory, Oxford University Press, 1997
 I. Vidav, Algebra, DMFA, Ljubljana 1980

Cilji in kompetence:

Študentje poglobijo znanje osnove teorije grup in njihovih upodobitev.

Objectives and competences:

Students deepen the knowledge of the concepts of the theory of groups and their representations.

Predvideni študijski rezultati:

Znanje in razumevanje:

- Razumevanje osnov teorije grup in njihovih upodobitev.
- Poznavanje osnovnih značilnosti in tipičnih primerov grup.

Prenosljive/ključne spretnosti in drugi atributi:

- Pridobljena znanja prispevajo k razumevanju ostalih predmetov s področja algebre, geometrije in topologije.

Intended learning outcomes:

Knowledge and Understanding:

- To understand the main concepts of groups and their representations.
- To recognize the typical properties and main examples of groups.

Transferable/Key Skills and other attributes:

- The obtained knowledge contributes to better understanding of other subjects in fields of algebra, geometry and topology.

Metode poučevanja in učenja:

- Predavanja
- Seminarske vaje

Learning and teaching methods:

- Lectures
- Tutorial

Načini ocenjevanja:

Način (pisni izpit, ustno izpraševanje, naloge, projekt): Pisni izpit – praktični del Ustni izpit – teoretični del	Delež (v %) / Weight (in %) 50% 50%	Type (examination, oral, coursework, project): Written exam – practical part Oral exam – theoretical part
Pisni izpit – praktični del se lahko nadomesti z dvema delnima testoma (sprotni obveznosti).		Written exam – practical part can be replaced by two partial tests (mid-term testing).
Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.		Each of the mentioned commitments must be assessed with a passing grade.
Opravljen pisni del izpita je pogoj za		Passing grade of the written exam is

pristop k teoretičnem delu izpita.		required for taking the oral exam.
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Reference nosilca / Lecturer's references:

1. BENKOVIČ, Dominik, GRAŠIČ, Mateja. Jordan $\{g, h\}$ -derivations of unital algebras. *Operators and matrices*. 2022, vol. 16, no. 2, str. 415-428. ISSN 1846-3886. <http://oam.ele-math.com/16-32/Jordan-g,h-derivations-of-unital-algebras>, DOI: [10.7153/oam-2022-16-32](https://doi.org/10.7153/oam-2022-16-32). [COBISS.SI-ID [114972163](https://www.cobiss.si/id/114972163)]
2. XIA, Yong-Hui, GRAŠIČ, Mateja, HUANG, Wentao, ROMANOVSKI, Valery. Limit cycles in a model of olfactory sensory neurons. *International journal of bifurcation and chaos in applied sciences and engineering*. 2019, vol. 29, no. 3, str. 1950038-1-1950038-9. ISSN 0218-1274. DOI: [10.1142/S021812741950038X](https://doi.org/10.1142/S021812741950038X). [COBISS.SI-ID [22250006](https://www.cobiss.si/id/22250006)]
3. BENKOVIČ, Dominik, GRAŠIČ, Mateja. Generalized skew derivations on triangular algebras determined by action on zero products. *Communications in algebra*. 2018, vol. 46, iss. 5, str. 1859-1867. ISSN 0092-7872. <https://doi.org/10.1080/00927872.2017.1360334>, DOI: [10.1080/00927872.2017.1360334](https://doi.org/10.1080/00927872.2017.1360334). [COBISS.SI-ID [18505817](https://www.cobiss.si/id/18505817)]