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		Modul S2			**1. ali 2.**		**1. ali 3.**	
Mathematics, 2nd cycle		Module S2			**1. or 2.**		**1. or 3.**	
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		**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:	**Prerequisits:**
Ne.	None.
Vsebina:	**Content (Syllabus outline):**
Simetrične grupe. Konjugirani elementi in podgrupe. Delovanje grupe na množico. Linearne grupe: glavne lastnosti in primeri. Izreki Sylowa. Podajanje grupe z generatorji in relacijami. Direktni produkt grup. Abelove grupe. Enostavne grupe. Komutant grupe, rešljivost končnih p-grup in grupe zgornje	Symetric groups. Conjugated elements and subgroups. The action of a group on a set. Linear groups: main properties and examples. Sylow's theorems. Definition of a group by generators and relations. Direct product of groups. Abelian groups. Simple groups. Derived group, solvability of finite p-groups and the group of upper triangular matrices.

trikotnih matrik. Upodobitve grup: osnovni pojmi in primeri.	Representations of groups: concepts and examples.

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 basic 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.

Prenesljive/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:

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):	Delež (v %) / Weight (in %)	Type (examination, oral, coursework, project):
Pisni izpit – praktični del	50%	Written exam – practical part
Ustni izpit – teoretični del	50%	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 pristop k teoretičnem delu izpita.		Passing grade of the written exam is required for taking the oral exam.

Reference nosilca / Lecturer's references:

1. 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*, ISSN 0218-1274, 2019, vol. 29, no. 3, str. 1950038-1-1950038-9, doi: 10.1142/S021812741950038X. [COBISS.SI-ID 22250006]

2. BENKOVIČ, Dominik, GRAŠIČ, Mateja. Generalized skew derivations on triangular algebras determined by action on zero products. *Communications in algebra*, ISSN 0092-7872, 2018, vol. 46, iss. 5, str. 1859-1867. https://doi.org/10.1080/00927872.2017.1360334, doi: 10.1080/00927872.2017.1360334. [COBISS.SI-ID 18505817]

3. GRAŠIČ, Mateja. Zero product determined Jordan algebras, II. *Algebra colloquium*, ISSN 1005-3867, 2015, vol. 22, iss. 1, str. 109-118, doi: 10.1142/S1005386715000103. [COBISS.SI-ID 21136136]