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
Izobraževalna matematika – enopredmetna, 2. Stopnja	**Modul I2**	**1. ali 2.**	**1. ali 3.**
Educational mathematics - single-major, 2nd cycle	**Module I2**	**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**			**105**	**6**

Nosilec predmeta / Lecturer:	Mateja GRAŠIČ

Jeziki /	**Predavanja / Lectures:**	SLOVENSKO/SLOVENE
Languages:	**Vaje / Tutorial:**	SLOVENSKO/SLOVENE

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Jih ni.	None.

Vsebina:	**Content (Syllabus outline):**
Simetrične grupe. Konjugirani elementi in podgrupe. Delovanje grupe na množico. Linearne grupe: osnovne 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 trikotnih matrik. Upodobitve grup: osnovni pojmi in primeri.	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. 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 osnovnih pojmov, povezanih z grupami in njihovimi upodobitvami.
- 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		Passing grade of the written exam is

k teoretičnem delu izpita.	required for taking the oral exam.

Reference nosilca / Lecturer's references:

1. 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]

2. 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]

3. BENKOVIČ, Dominik, GRAŠIČ, Mateja. Generalized derivations on unital algebras determined by action on zero products. *Linear Algebra and its Applications*, ISSN 0024-3795. [Print ed.], 2014, vol. 445, str. 347-368. http://dx.doi.org/10.1016/j.laa.2013.12.010. [COBISS.SI-ID 20314120]

4. BIERWIRTH, Hannes, BREŠAR, Matej, GRAŠIČ, Mateja. On maps determined by zero products. *Communications in algebra*, ISSN 0092-7872, 2012, vol. 40, no. 6, str. 2081-2090. http://dx.doi.org/10.1080/00927872.2011.570833. [COBISS.SI-ID 16315481]

5. GRAŠIČ, Mateja. Zero product determined Jordan algebras, I. *Linear and Multilinear Algebra*, ISSN 0308-1087, 2011, vol. 59, no. 6, str. 671-685. http://dx.doi.org/10.1080/03081087.2010.485199. [COBISS.SI-ID 15927641]