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, 2nd degree		**1. or 2.**	**1. or 3.**

Vrsta predmeta / Course type	
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:	Dušan PAGON

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: 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 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:

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).

Assessment:

Reference nosilca / Lecturer's references:

1. PAGON, Dušan, REPOVŠ, Dušan, ZAICEV, Mikhail. On the codimension growth of simple color Lie superalgebras. *J. Lie theory*, 2012, vol. 22, no. 2, str. 465-479. http://www.heldermann.de/JLT/JLT22/JLT222/jlt22017.htm. [COBISS.SI-ID 16070233]

2. PAGON, Dušan. Simplified square equation in the quaternion algebra. *International journal of pure and applied mathematics*, 2010, vol. 61, no. 2, str. 231-240. [COBISS.SI-ID 17718024]

3. GUTIK, Oleg, PAGON, Dušan, REPOVŠ, Dušan. On chains in H-closed topological pospaces. *Order (Dordr.)*, 2010, vol. 27, no. 1, str. 69-81. http://dx.doi.org/10.1007/s11083-010-9140-x. [COBISS.SI-ID 15502169]

4. GUTIK, Oleg, PAGON, Dušan, REPOVŠ, Dušan. The continuity of the inversion and the structure of maximal subgroups in countably compact topological semigroups. *Acta math. Hung.*, 2009, vol. 124, no. 3, str. 201-214. http://dx.doi.org/10.1007/s10474-009-8144-8, doi: 10.1007/s10474-009-8144-8. [COBISS.SI-ID 15212121]

5. PAGON, Dušan. The dynamics of selfsimilar sets generated by multibranching trees. *International journal of computational and numerical analysis and applications*, 2004, vol. 6, no. 1, str. 65-76. [COBISS.SI-ID 14037081]