



Univerza v Mariboru



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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 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:

Vaje / Tutorial:

SLOVENSKO/SLOVENE

SLOVENSKO/SLOVENE

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

Poznavanje algebre.

Prerequisites:

Knowledge of algebra.

Vsebina:

Simetrične grupe. Konjugirani elementi in podgrupe. Delovanje grupe na množico. Linearne grupe: osnovne značilnosti 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.

Content (Syllabus outline):

Symmetric 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.

Upodobitve grup: osnovni pojmi in primeri.

Representations of groups: basic 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:

Način (pisni izpit, ustno izpraševanje, naloge, projekt)

Pisni test – praktični del

Izpit (ustni) – teoretični del

Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.

Pozitivna ocena pri pisnem testu je pogoj za pristop k izpitu.

Delež (v %) /
Weight (in %)

50%

50%

Assessment:

Type (examination, oral, coursework, project):

Written test – practical part

Exam (oral) – theoretical part

Each of the mentioned commitments must be assessed with a passing grade.

Passing grade of the written test is required for taking the exam.

Reference nosilca / Lecturer's references:		
1. PAGON, Dušan, REPOVŠ, Dušan, ZAICEV, Mikhail. On the codimension growth of simple color Lie superalgebras. <i>J. Lie theory</i>, 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. <i>International journal of pure and applied mathematics</i>, 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. <i>Order (Dordr.)</i>, 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. <i>Acta math. Hung.</i>, 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. <i>International journal of computational and numerical analysis and applications</i>, 2004, vol. 6, no. 1, str. 65-76. [COBISS.SI-ID 14037081]		