



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	Modul S2	1. ali 2.	1. ali 3.
Mathematics, 2 nd degree	Module S2	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]		