



Fakulteta za naravoslovje
in matematiko

| UČNI NAČRT PREDMETA / COURSE SYLLABUS | | | | | | |
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| 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 cycle | | | | | 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 | | | 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: | | | | Prerequisites: | | |
| Ne. | | | | None. | | |
| Vsebina: | | | | Content (Syllabus outline): | | |
| <p>Simetrične grupe. Konjugirani elementi in podgrupe. Delovanje grupe na množico. Linearne grupe: osnovne lastnosti in primeri.</p> <p>Izreki Sylowa. Podajanje grupe z generatorji in relacijami. Direktni produkt grup. Abelove grupe.</p> <p>Enostavne grupe. Komutant grupe, rešljivost končnih p-grup in grupe zgornje trikotnih matrik.</p> | | | | <p>Symetric groups. Conjugated elements and subgroups. The action of a group on a set. Linear groups: main properties and examples.</p> <p>Sylow's theorems. Definition of a group by generators and relations. Direct product of groups. Abelian groups.</p> <p>Simple groups. Derived group, solvability of finite p-groups and the group of upper triangular matrices.</p> | | |

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| Upodobitve grup: osnovni pojmi in primeri. | Representations of groups: concepts and examples. |
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Temeljni literatura in viri / Readings:

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| <p>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</p> |
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Cilji in kompetence:

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| Študentje poglobijo znanje osnove teorije grup in njihovih upodobitev. |
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Objectives and competences:

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| Students deepen the knowledge of the concepts of the theory of groups and their representations. |
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Predvideni študijski rezultati:

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| <p>Znanje in razumevanje:</p> <ul style="list-style-type: none"> Razumevanje osnov teorije grup in njihovih upodobitev. Poznavanje osnovnih značilnosti in tipičnih primerov grup. <p>Prenosljive/ključne spretnosti in drugi atributi:</p> <ul style="list-style-type: none"> Pridobljena znanja prispevajo k razumevanju ostalih predmetov s področja algebre, geometrije in topologije. |
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Intended learning outcomes:

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| <p>Knowledge and Understanding:</p> <ul style="list-style-type: none"> To understand the main concepts of groups and their representations. To recognize the typical properties and main examples of groups. <p>Transferable/Key Skills and other attributes:</p> <ul style="list-style-type: none"> The obtained knowledge contributes to better understanding of other subjects in fields of algebra, geometry and topology. |
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Metode poučevanja in učenja:

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| <ul style="list-style-type: none"> Predavanja Seminarske vaje |
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Learning and teaching methods:

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| <ul style="list-style-type: none"> Lectures Tutorial |
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Načini ocenjevanja:

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| <p>Način (pisni izpit, ustno izpraševanje, naloge, projekt):</p> <p>Pisni izpit – praktični del</p> <p>Ustni izpit – teoretični del</p> <p>Pisni izpit – praktični del se lahko nadomesti z dvema delnima testoma (sprotni obveznosti).</p> <p>Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.</p> <p>Opravljen pisni del izpita je pogoj za</p> | <p>Delež (v %) / Weight (in %)</p> <p>50%</p> <p>50%</p> | <p>Type (examination, oral, coursework, project):</p> <p>Written exam – practical part</p> <p>Oral exam – theoretical part</p> <p>Written exam – practical part can be replaced by two partial tests (mid-term testing).</p> <p>Each of the mentioned commitments must be assessed with a passing grade.</p> <p>Passing grade of the written exam is</p> |
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| pristop k teoretičnem delu izpita. | | required for taking the oral exam. |
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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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1142/S1005386715000103). [COBISS.SI-ID [21136136](#)]