UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Osnove teorije grup
Course title:	Basic Group Theory

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/		
Five-year master's degree program Subject Teacher	/	3.	6.

Vrsta predmeta / Course type Obvezni / Obligatory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30		15			45	3

Nosilec predmeta / Lecturer: Mateja Grašič

Jeziki /	**Predavanja / Lectures:**	**slovenski / Slovene**
Languages:	**Vaje / Tutorial:**	**slovenski / Slovene**

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

Pogojev ni.

Prerequisits:

None.

Vsebina:

- Binarne operacije, polgrupe, monoidi.
- Grupe, podgrupe, direktni produkt grup. Primeri.
- Generatorji grup, ciklične grupe, red elementa.
- Homomorfizmi grup, izomorfnost, Cayleyev izrek.
- Odseki in Lagrangeov izrek, podgrupe edinke, kvocientne grupe, izrek o izomorfizmu.

Content (Syllabus outline):

- Binary operations, semigroups, monoids.
- Groups, subgroups, direct product of groups. Examples.
- Group generators, cyclic groups, order of an element.
- Homomorphisms of groups, isomorphisms, Cayley's theorem.
- Cosets and Lagrange's theorem, normal subgroups, quotient groups, isomorphism theorem.

Temeljni literatura in viri / Readings:

M. Brešar, Uvod v algebro, DMFA, 2018.

S. Lang, Undergraduate Algebra, Springer, 2005 (elektronski vir)
https://docs.google.com/file/d/0B1pXoUPGwCetajA1Sk50cmNOaDA/edit?pli=1&resourcekey=0-Wr_M1hsJEB4Ix4sbSDzfgg

L.N. Childs, A concrete introduction to higher algebra, 3rd Edition, Springer, 2009

I. Vidav, Algebra, DMFA, Ljubljana 1980

Cilji in kompetence:	**Objectives and competences:**
Študent spozna temeljne koncepte v teoriji grup. Pri tem se uči abstraktnega načina razmišljanja.	Students learn the fundamental concepts in group theory. In doing so, they also learn abstract thinking.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Po zaključku tega predmeta bo študent sposoben • razumeti osnovne pojme iz teorije grup. • razložiti in uporabljati osnovne rezultate teorije grup; • za reševanje problemov uporabiti teorijo grup. Prenesljive/ključne spretnosti in drugi atributi: • Spretnosti komuniciranja: pisno izražanje pri pisnem izpitu. • Uporaba informacijske tehnologije: uporaba računala ali računalniških aplikacij pri reševanju problemov. • Reševanje problemov: reševanje problemov s pomočjo metod iz teorije grup.	Knowledge and understanding: On completion of this course, the student will be able to • understand the basic concepts of group theory. • explain and apply the basic results of group theory; • apply group theory to solve problems. Transferable/key skills and other attributes: • Communication skills: written expression in the written examination. • Use of information technology: use of computer or computer applications in problem solving. • Problem solving: problem solving using methods from group theory.

Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanja • Seminarske vaje • Individualno delo	• Lectures • Exercises • Individual work

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Izpit: Pisni izpit	**100%**	Exam: Written exam

Opomba: Pisni izpit vključuje probleme in teorijo.

Comment: Written exam includes problems and theory.

Reference nosilca / Lecturer's references:

1. BENKOVIČ, Dominik, GRAŠIČ, Mateja. Jordan {g,h}{�,*h*}-derivations of unital algebras. *Operators and matrices*. 2022, vol. 16, no. 2, str. 415-428. ISSN 1846-3886. http://oam.ele-math.com/16-32/Jordan-g,h-derivations-of-unital-algebras, DOI: 10.7153/oam-2022-16-32. [COBISS.SI-ID 114972163],
2. GRAŠIČ, Mateja, TRATNIK, Niko. *Zbrano gradivo : vaje pri predmetu Osnove linearne algebre in vektorske analize*. Maribor: Fakulteta za naravoslovje in matematiko, Oddelek za matematiko in računalništvo, 2021. 1 spletni vir (1 datoteka PDF (IV, 49 str.)). https://omr.fnm.um.si/wp-content/uploads/2019/01/olava_gradivo_vaje.pdf. [COBISS.SI-ID 73445123]
3. 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*. 2019, vol. 29, no. 3, str. 1950038-1-1950038-9. ISSN 0218-1274. DOI: 10.1142/S021812741950038X. [COBISS.SI-ID 22250006],
4. BENKOVIČ, Dominik, GRAŠIČ, Mateja. Generalized skew derivations on triangular algebras determined by action on zero products. *Communications in algebra*. 2018, vol. 46, iss. 5, str. 1859-1867. ISSN 0092-7872. https://doi.org/10.1080/00927872.2017.1360334, DOI: 10.1080/00927872.2017.1360334. [COBISS.SI-ID 18505817].