UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Geometrija
Course title:	Geometry

Študijski program in stopnja **Study programme and level**	Študijska smer **Study field**	Letnik **Academic year**	Semester **Semester**
Matematika		3.	6.
Mathematics		3.	6.

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			105	6

Nosilec predmeta / Lecturer:	Tanja Dravec

Jeziki / **Languages:**	Predavanja / **Lectures:**	SLOVENSKO/SLOVENE
	Vaje / **Tutorial:**	SLOVENSKO/SLOVENE

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Vsaka izmed naštetih obveznosti v načinih ocenjevanja mora biti opravljena s pozitivno oceno. Pozitivna ocena pri pisnem izpitu je pogoj za pristop k ustnemu izpitu.	Each of the mentioned commitments must be assessed with a passing grade. Passing grade of the written exam is required for taking the oral exam.

Vsebina:	**Content (Syllabus outline):**
Hilbertov aksiomatski sistem za absolutno geometrijo: aksiomi povezave, urejenosti, skladnosti in zveznosti. Aksiom o vzporednicah in njegovi ekvivalenti.	Hilbert's axiomatic system for absolute geometry: incidence axioms, ordering axioms, congruence axioms and continuity axioms. Parallel postulate and its equivalents. .

Afini prostori, afine transformacije, aksiomatsko definirana afina geometrija.	Affine spaces, affine transformations, axiomatic definition of affine geometry.
Aksiomi projektivne geometrije, Desarguesov izrek. Harmonični elementi. Homogene in nehomogene koordinate v projektivni ravnini. Projektivne transformacije.	Axioms of projective geometry, Desargues' theorem. Harmonic elements. Homogeneous and non-homogeneous coordinate systems in the projective plane. Projective transformations.

Temeljni literatura in viri / Readings:

1. Coxeter, H. S. M. (1993). *The real projective plane: with an appendix for mathematica by George Beck: PC Version (Diskette provided)* (3rd ed., str. XIII, 222). Springer.
2. Mitrović, M. (2009). *Projektivna geometrija* (Let. 88, str. 150). DMFA - založništvo.
3. Vidav, I. (1981). *Afina in projektivna geometrija* (Let. 15, str. 170). Društvo matematikov, fizikov in astronomov SRS.
4. Rosenbaum, R. A. (1963). *Introduction to projective geometry and modern algebra* (str. VIII, 344). Addison-Wesley.
5. Pagon, D. (1995). *Osnove evklidske geometrije* (str. 124). DZS.
6. Berger, M. (1987). *Geometry I: with 426 figures* (str. XIII, 427). Springer.

Dodatna literatura / Additional Readings:
1. Ayres, F. (1967). *Schaum's outline of theory and problems of projective geometry* (str. 243). McGraw-Hill.

Cilji in kompetence:

Študentje spoznajo aksiomatsko zasnovo evklidske geometrije ter osnove afine in projektivne geometrije.

Objectives and competences:

Students get familiar with axiomatic approach to Euclidean geometry and the basic concepts of afffine and projective geometry.

Predvideni študijski rezultati:

Znanje in razumevanje:
Po zaključku tega predmeta bo študent sposoben
- razumevati Hilbertov aksiomatski sistem za evklidsko geometrijo.
- razložiti in uporabljati osnovne izreke evklidske geometrije.
- poznati osnovne pojme afine in projektivne geometrije.

Intended learning outcomes:

Knowledge and Understanding:
On completion of this course the student will be able to
- understand the Hilbert axiomatic system for Euclidean geometry.
- explain and use basic theorems from Euclidean geometry.

- recognize the basic concepts of affine

• razlikovati med različnimi neevklidskimi geometrijami.		• and projective geometry • distinguish between different non-Euclidean geometries.
Prenesljive/ključne spretnosti in drugi atributi: • Pridobljena znanja prispevajo k razumevanju ostalih predmetov s področja geometrije in topologije.		Transferable/Key Skills and other attributes: • The obtained knowledge contributes to better understanding of other subjects in fields of geometry and topology.

Metode poučevanja in učenja:

- Predavanja
- Teoretične vaje

Learning and teaching methods:

- Lectures
- Theoretical exercises

Načini ocenjevanja	Delež (v %)/ Weight (in %)	Assessment:
Pisni izpit Ustni izpit	50% 50%	Written exam Oral exam

Opombe:
Pisni izpit se lahko nadomesti s kolokviji v enakem deležu 50%.

Comments:
Written exam can be replaced by written midterm examination in the weight of 50%.

Reference nosilca / Lecturer's references:

1. BREŠAR, Boštjan, DRAVEC, Tanja, KLESZCZ, Elżbieta. Uniquely colorable graphs up to automorphisms. *Applied mathematics and computation*. [Print ed.]. Aug. 2023, vol. 450, art. 128007 (10 str.). ISSN 0096-3003. https://www.sciencedirect.com/science/article/pii/S0096300323001765, DOI: 10.1016/j.amc.2023.128007.
2. DRAVEC, Tanja, TARANENKO, Andrej. Daisy Hamming graphs. *Discussiones mathematicae. Graph theory*. 2023, vol. 43, no. 2, str. 421-436. ISSN 1234-3099. DOI: 10.7151/dmgt.2373.
3. DRAVEC, Tanja, JAKOVAC, Marko, KOS, Tim, MARC, Tilen. On graphs with equal total domination and Grundy total domination numbers. *Aequationes mathematicae*. Feb. 2022, vol. 96, iss. 1, 137-146. ISSN 0001-9054. https://link.springer.com/article/10.1007/s00010-021-00776-z, DOI: 10.1007/s00010-021-00776-z.
4. BREŠAR, Boštjan, DRAVEC, Tanja, GORZKOWSKA, Aleksandra, KLESZCZ, Elżbieta. Graphs with a unique maximum independent set up to automorphisms. *Discrete applied mathematics*. [Print ed.]. Aug. 2022, vol. 317, str. 124-135. ISSN 0166-218X. https://www.sciencedirect.com/science/article/pii/S0166218X22001251,

DOI: 10.1016/j.dam.2022.04.003.

5. DRAVEC, Tanja. On the toll number of a graph. *Discrete applied mathematics*. [Print ed.]. Nov. 2022, vol. 321, str. 250-257. ISSN 0166-218X. DOI: 10.1016/j.dam.2022.07.006.