Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

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:**
Jih ni.	There are none.
Vsebina:	**Content (Syllabus outline):**
Hilbertov aksiomatski sistem za absolutno geometrijo: aksiomi povezave, urejenosti, skladnosti in zveznosti. Aksiom o vzporednicah in njegovi ekvivalenti. Aritmetični model dvorazsežne evklidske geometrije. Afini prostori, afine transformacije, aksiomatsko definirana afina geometrija. Aksiomi projektivne geometrije, Desarguesov	Hilbert's axiomatic system for absolute geometry: incidence axioms, ordering axioms, congruence axioms and continuity axioms. Parallel postulate and its equivalents. The arithmetic model of Euclidean plane. Affine spaces, affine transformations, axiomatic definition of affine geometry.

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:

M. Hvidsten, Geometry with Geometry Explorer, McGraw-Hill, NY 2005
M. Mitrović, Projektivna geometrija, DMFA-založništvo, Ljubljana 2009
H. S. M. Coxeter, Projective Geometry, Springer 2003
C.-A. Faure, A. Frölicher, Modern Projective Geometry, Kluwer 2000
D. Pagon, Osnove evklidske geometrije, DZS, Ljubljana 1995
M. Berger, Geometry I, Springer-Verlag Berlin Heidelberg, 1987

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.
- razlikovati med različnimi neevklidskimi geometrijami.

Prenesljive/ključne spretnosti in drugi atributi:

- Pridobljena znanja prispevajo k razumevanju ostalih predmetov s področja geometrije in topologije.

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 and projective geometry
- distinguish between different non-Euclidean geometries.

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:		**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt): Pisni izpit – praktični del Ustni izpit – teoretični del Pisni izpit – praktični del se lahko nadomesti z dvema delnima testoma (sprotni obveznosti). Pozitivna ocena pri pisnem testu je pogoj za pristop k ustnemu izpitu.	Delež (v %) / Weight (in %) 50% 50%	Type (examination, oral, coursework, project): Written exam – practical part Oral exam – theoretical part Written exam – practical part can be replaced by two partial tests (mid-term testing). Passing grade of the written test is required for taking the oral exam.

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.