UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Matematične krivulje
Course title:	Mathematical Curves

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	/	3. ali/or 4.	6. ali /or 8.
Five-year master's degree program Subject Teacher	/		

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
15	15	15			45	**3**

Nosilec predmeta / Lecturer: Matevž ČREPNJAK

Jeziki / Languages:	Predavanja / Lectures:	slovenski / Slovenian
	Vaje / Tutorial:	slovenski / Slovenian

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

Prerequisits:

Opravljen izpit iz Osnov analize in Analize	Exam in Basic Analysis, Analysis

Vsebina:

- Krivulje v ravnini. Sistematizcija krivulj.
- Parametrizacija, tangenta, locna dolžina.
- Primeri ravninskih krivulj: stožnice, krivulje tretje stopnje, krivulje cetrte stopnje, cikloidne krivulje, transcendentne krivulje.
- Singularna tocka. Ogrinjaca.
- Šestnajsti Hilbertov problem.

Content (Syllabus outline):

- Planar curves. Systematization of curves.
- Parametrization, tangent, arc length.
- Examples of planar curves: curves of degree 2, curves of degree 3, curves of degree 4, cyclic curves, transcendental curves.
- Singular point. Hull.
- Hilbert's sixteenth problem

Temeljni literatura in viri / Readings:

M. Razpet: *Ravninske krivulje*. Ljubljana: Knjižnica sigma, DMFA, 1998.

I.Vidav: *Eliptične krivulje in eliptične funkcije.* Ljubljana: DMFA, 1991.

M.Dobovišek: *Rešene naloge iz analize II.* Ljubljana: DMFA, 1996.

B. Hvala: *Zbirka izpitnih nalog iz analize.* Ljubljana: DMFA, 1996.

D. Benkovic: *Analiza II* (dodatna gradiva na spletu)

Cilji in kompetence:

Poglobiti znanje glavnih dejstev o krivuljah.

Poglobiti znanje o ravninskih krivuljah.

Poglobiti znanje o konstrukcijah krivulj in njihovem zgodovinskem razvoju.

Objectives and competences:

Deepening the knowledge of basic facts about curves.

Deepening the knowledge of planar curves.

Deepening the knowledge of constructions of curves and their historical development.

Predvideni študijski rezultati:

Znanje in razumevanje:

- Študent poglobi znanje o osnovah diferencialne geometrije krivulj v ravnini.
- Študent poglobi znanje o ravninskih krivuljah, njihovih lastnostih in konstrukcijah.

Intended learning outcomes:

Knowledge and Understanding:

- Deepening the knowledge of the basic facts about differential geometry of curves in plane.
- Deepening the knowledge of the concepts of planar curves, their properties and constructions.

Prenesljive/kljucne spretnosti in drugi atributi:	Transferable/Key Skills and other attributes:
• Prenos znanja v zvezi s krivuljami na druga podrocja (geografija, astronomija, fizika)	• Knowledge transfer of the concepts, connected with curves into other fields (geography, astronomy, physics).

Metode poučevanja in učenja:

Learning and teaching methods:

Metode poučevanja in učenja	Learning and teaching methods
• Predavanja • Seminarji • Seminarske vaje • Individualno delo	• Lectures • Seminars • Tutorial • Individual work

Delež (v %) /

Načini ocenjevanja:	Weight (in %)	**Assessment:**
Pisni izpit – praktični del	40%	Written exam – practical part
Ustni izpit – teoretični del	40%	Oral exam – theoretical part
Seminarska naloga	20%	Seminar
Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.		Each of the mentioned commitments must be assessed with a passing grade.
Pozitivna ocena pri pisnem izpitu je pogoj za pristop k ustnemu izpitu.		Passing grade of the written exam is required for taking the oral exam.

Reference nosilca / Lecturer's references:

1. BANIČ, Iztok, ČREPNJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš, SOVIČ, Tina. The closed subset theorem for inverse limits with upper semicontinuous bonding functions. Bulletin of the Malaysian Mathematical Society, ISSN 0126-6705, 2019, vol. 42, iss. 3, str. 835-846, doi: 10.1007/s40840-017-0517-5. [COBISS.SI-ID 23281928].
2. BANIČ, Iztok, ČREPNJAK, Matevž. Inverse component cropping sequences and connected inverse limits over intervals. *Glasnik matematički. Serija 3*, ISSN 0017-095X, 2018, vol. 53, no. 2, str. 371-384. https://web.math.pmf.unizg.hr/glasnik/53.2/53(2)-09.pdf, doi: 10.3336/gm.53.2.09. [COBISS.SI-ID 24323848].
3. BANIČ, Iztok, ČREPNJAK, Matevž. Markov pairs, quasi Markov functions and inverse limits. Houston journal of mathematics, ISSN 0362-1588, 2018, vol. 44, no. 2, str. 695-707. https://www.math.uh.edu/~hjm/restricted/pdf44(2)/16banic.pdf. [COBISS.SI-ID 18407001].
4. BANIČ, Iztok, ČREPNJAK, Matevž, MERHAR, Matej, MILUTINOVIĆ, Uroš. The (weak) full projection property for inverse limits with upper semicontinuous bonding functions. Mediterranean journal of mathematics, ISSN 1660-5446, Aug. 2018, vol. 15, iss. 4, str. 1-21, doi: 10.1007/s00009-018-1209-6. [COBISS.SI-ID 23960328].
5. ČREPNJAK, Matevž, TRATNIK, Niko. The Szeged index and the Wiener index of partial cubes with applications to chemical graphs. Applied mathematics and computation, ISSN 0096-3003. [Print ed.], 2017, vol. 309, str. 324-333, doi: 10.1016/j.amc.2017.04.011. [COBISS.SI-ID 23105544].