



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Programska oprema za matematike
Course title:	Software for mathematicians

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Izobraževalna matematika, dvopredmetni študij, 2. stopnja	Modul D2	1. ali 2.	2. ali 4.
Educational mathematics, double major 2 nd degree	Module D2	1. or 2.	2. or 4.

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
15			30		45	3

Nosilec predmeta / Lecturer:

Andrej TARANENKO

**Jeziki /
Languages:**

Predavanja /

SLOVENSKO/SLOVENE

Lectures:

Vaje / Tutorial: SLOVENSKO/SLOVENE

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

Jih ni.

Prerequisites:

There are none.

Vsebina:

- Oblikovanje matematičnih besedil: uporaba in osnove programa LaTeX
- Programi za numerično računanje: uporaba in osnove programa za numerično računanje, npr. SciLab, MatLab, Octave, Sage
- Programi za simbolno računanje: uporaba in osnove programa za simbolno računanje, npr. Mathematica, Maxima, Sage

Content (Syllabus outline):

- Editing mathematical texts: basics and usage of LaTeX
- Software for numerical computing: basics and usage of a numerical computing software like SciLab, Matlab, Octave, Sage
- Software for algebraic computing: basics and usage of a algebraic computing software like Mathematica, Maxima, Sage

- Programi za statistično obdelavo podatkov: uporaba in osnove programa za statistično obdelavo podatkov, npr. SPSS, R

- Software for statistics: basics and usage of a software for statistics like SPSS, R

Temeljna literatura in viri / Readings:

Odvisno od izbrane programske opreme. Npr.:

- Oetiker Tobias in drugi, Ne najkrajši uvod v LaTeX.
- Griffiths D. F., Higham D. J., Learning latex, Philadelphia SIAM, 1997.
- Abell M. L., Braselton J. P., Mathematica by example, San Diego, Academic press, 1997
- Gašperšič M., Matlab do nezavesti, Trzin, 2009.
- Morgan G. A. in drugi, SPSS for introductory statistics: use and interpretation, London : Lawrence Erlbaum, 2004

Cilji in kompetence:

- Spoznati osnove oblikovanja matematičnih besedil s paketom LaTeX
- Spoznati osnove dela s programom za numerično računanje.
- Spoznati osnove dela s programom za simbolno računanje.
- Spoznati osnove dela s programom za statistično obdelavo podatkov.

Objectives and competences:

- To know basics of mathematical text editing using the LaTeX package.
- To know basics of a software for numerical computing.
- To know basics of a software for algebraic computing.
- To know basics of a software for statistical data manipulation.

Predvideni študijski rezultati:

Znanje in razumevanje:

- Zna uporabljati paket LaTeX pri oblikovanju matematičnih besedil.
- Zna uporabljati program za numerično računanje.
- Zna uporabljati program za simbolno računanje.
- Zna uporabljati program za statistično obdelavo podatkov.

Prenesljive/ključne spretnosti in drugi atributi:

- Sposoben poiskati ustrezno programsko opremo za reševanje problemov.
- Sposoben določiti vrsto programske opreme za pomoč pri reševanju danega problema.

Intended learning outcomes:

Knowledge and Understanding:

- Knows how to use LaTeX when editing mathematical texts.
- Knows how to use numerical computing software.
- Knows how to use algebraic computing software.
- Knows how to use statistical data manipulation software.

Transferable/Key Skills and other attributes:

- Is capable to find appropriate software for help with solving problems.
- Is capable to determine thy type of software needed for solving a certain problem.

Metode poučevanja in učenja:

Learning and teaching methods:

<ul style="list-style-type: none"> • Predavanja • Laboratorijske vaje • Samostojno delo 	<ul style="list-style-type: none"> • Lectures • Laboratory exercises • Individual work
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Načini ocenjevanja:

Assessment:

	Delež (v %) / Weight (in %)	
<u>Sprotno preverjanje:</u>		<u>Mid-term testing:</u>
Domače naloge	50%	Homework
Projekt	50%	Project
Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.		Each of the mentioned commitments must be assessed with a passing grade.

Reference nosilca / Lecturer's references:

1. TARANENKO, Andrej, VESEL, Aleksander. 1-factors and characterization of reducible faces of plane elementary bipartite graphs. *Discuss. Math., Graph Theory*, 2012, vol. 32, no. 2, str. 289-297, doi: [10.7151/dmgt.1607](https://doi.org/10.7151/dmgt.1607). [COBISS.SI-ID 19104264]
2. TARANENKO, Andrej, ŽIGERT, Petra. Resonant sets of benzenoid graphs and hypercubes of their resonance graphs. *MATCH Commun. Math. Comput. Chem. (Krag.)*, 2012, vol. 68, no. 1, str. 65-77. <http://www.pmf.kg.ac.rs/match/content68n1.htm>. [COBISS.SI-ID 16051990]
3. KLAVŽAR, Sandi, SALEM, Khaled, TARANENKO, Andrej. Maximum cardinality resonant sets and maximal alternating sets of hexagonal systems. *Comput. math. appl. (1987)*. [Print ed.], 2010, vol. 59, no. 1, str. 506-513. <http://dx.doi.org/10.1016/j.camwa.2009.06.011>. [COBISS.SI-ID 15383641]
4. TARANENKO, Andrej, VESEL, Aleksander. Characterization of reducible hexagons and fast decomposition of elementary benzenoid graphs. *Discrete appl. math.*. [Print ed.], 2008, vol. 156, iss. 10, str. 1711-1724. <http://dx.doi.org/10.1016/j.dam.2007.08.029>, doi: [10.1016/j.dam.2007.08.029](https://doi.org/10.1016/j.dam.2007.08.029). [COBISS.SI-ID 16140552]
5. TARANENKO, Andrej, VESEL, Aleksander. On elementary benzenoid graphs: new characterization and structure of their resonance graphs. *MATCH Commun. Math. Comput. Chem. (Krag.)*, 2008, #Vol. #60, #no. #1, str. 193-216, ilustr. [COBISS.SI-ID 1939989]