



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Računalniški praktikum
Course title: Programming Practicum

| Študijski program in stopnja Study programme and level | Študijska smer Study field | Letnik Academic year | Semester Semester |
|---|-------------------------------|-------------------------|----------------------|
| Matematika, 1. stopnja | | 1. | 2. |
| Mathematics, 1 st cycle | | 1. | 2. |

Vrsta predmeta / Course type

obvezni / compulsory

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 |
|------------------------|--------------------|-----------------------|------------------------------|---------------------------|-------------------------------|------|
| 30 | | | 60 | | 120 | 7 |

Nosilec predmeta / Lecturer:

Andrej TARANENKO

Jeziki /

Languages:

Predavanja /

Lectures:

SLOVENSKO/SLOVENE

Vaje / Tutorial:

SLOVENSKO/SLOVENE

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

Osnove računalništva in informatike

Prerequisites:

Fundamentals of Computer Science and Informatics

Vsebina:

Sistemska programska oprema: operacijski sistem (zgradba OS, vrste in primeri OS), prevajalnik, povezovalnik, nalagalnik, testni program.

Programsko okolje: priprava programa, prevajanje, testiranje in izvajanje.

Značilnosti sodobnih programskih jezikov.

Content (Syllabus outline):

System software: operating system (functions of OS, structure of OS, varieties of OS, examples of common OS), compiler, linker, loader, debugger.

Programming environment: program coding, compiling, testing and executing.

Characteristics of the state-of-the-art programming languages.

Osnove objektnega programiranja (objekti, metode, razredi, enkapsulacija, dedovanje, polimorfizem).

Modeli matematičnih objektov predstavljeni v izbranem programskem jeziku.

Principles of object-oriented programming (objects, methods, classes, encapsulation, inheritance, polymorphism).

Models of mathematical objects presented in the the chosen programming language.

Temeljni literatura in viri / Readings:

Deloma odvisni od izbranega programskega jezika:

npr. Edward R. Scheinerman, C++ for mathematicians : an introduction for students and professionals, Chapman & Hall/CRC, 2006

J. G. Brookshear, Computer science: an overview, Addison-Wesley, 2005.

K. B. Bruce, Foundations of object-oriented languages, MIT Press, 2002.

M. Mernik, V. Žumer, Programski jeziki, Fakulteta za elektrotehniko, računalništvo in informatiko, 2003.

Cilji in kompetence:

Spoznati zahtevnejše računalniške koncepte: operacijski sistem in druge vrste systemske programske opreme, računalniška omrežja in sodobne programske jezike.

Objectives and competences:

Know more demanding concepts from computer science: operation system and the other system software programs, computer networks and state-of-the-art programming languages.

Predvideni študijski rezultati:

Znanje in razumevanje:

- Razumevanje zahtevnejših principov računalništva.
- Spoznati vrste systemske programske opreme.
- Sposobnost pisanja kompleksnih programov.

Prenosljive/ključne spretnosti in drugi atributi:

- Prenos znanja računalništva na druga področja (matematika, biologija, kemija, optimizacija, ...).

Intended learning outcomes:

Knowledge and Understanding:

- Be able to understand more demanding principals of computer science.
- To know a variety of system software programs.
- Be able to write a complex computer program.

Transferable/Key Skills and other attributes:

- Knowledge transfer of methods of computer science to other fields (mathematics, chemistry, biology, optimization, ...).

| | | | |
|---|--------------------------------|--|--|
| Metode poučevanja in učenja: | | Learning and teaching methods: | |
| <ul style="list-style-type: none"> • Predavanja • Računalniške vaje | | <ul style="list-style-type: none"> • Lectures • Computer exercises | |
| Načini ocenjevanja: | | Assessment: | |
| | Delež (v %) / Weight (in %) | | |
| <u>Sprotno preverjanje:</u> | | <u>Mid-term testing:</u> | |
| Pisni testi – teorija (3 do 5 pisnih testov na semester) | 30% | Written tests – theory (from 3 to 5 written tests during the semester) | |
| Naloge | 20% | Coursework | |
| Projekt | 20% | Project | |
| <u>Izpit:</u> | 30% | <u>Exams:</u> | |
| Pisni izpit – problemi | | Written exam - problems | |
| Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno. | | Each of the mentioned commitments must be assessed with a passing grade. | |
| Opravljene sprotne obveznosti so pogoj za pristop k izpitu. | | Passing grades of all mid-term testings are required for taking the exam. | |

Reference nosilca / Lecturer's references:

1. BANIČ, Iztok, TARANENKO, Andrej. Span of a graph : keeping the safety distance. *Discrete mathematics & theoretical computer science*. 2023, vol. 25, no. 1, 19 str. ISSN 1365-8050. DOI: [10.46298/dmtcs.9859](https://doi.org/10.46298/dmtcs.9859). [COBISS.SI-ID [148408835](#)],
 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](https://doi.org/10.7151/dmgt.2373). [COBISS.SI-ID [137313795](#)],
 3. TARANENKO, Andrej. Daisy cubes: a characterization and a generalization. *European journal of combinatorics*. March 2020, vol. 85, art. 103058 [10 str.]. ISSN 0195-6698. <https://doi.org/10.1016/j.ejc.2019.103058>, DOI: [10.1016/j.ejc.2019.103058](https://doi.org/10.1016/j.ejc.2019.103058). [COBISS.SI-ID [18934105](#)],
 4. ZHU, Enqiang, TARANENKO, Andrej, SHAO, Zehui, XU, Jin. On graphs with the maximum edge metric dimension. *Discrete applied mathematics*. [Print ed.]. March 2019, vol. 257, str. 317-324. ISSN 0166-218X. <https://doi.org/10.1016/j.dam.2018.08.031>, DOI: [10.1016/j.dam.2018.08.031](https://doi.org/10.1016/j.dam.2018.08.031). [COBISS.SI-ID [18584665](#)],
 5. PETERIN, Iztok, SCHREYER, Jens, FECKOVÁ ŠKRABUL'ÁKOVÁ, Erika, TARANENKO, Andrej. A note on the Thue chromatic number of lexicographic products of graphs. *Discussiones mathematicae. Graph theory*. 2018, vol. 38, iss. 3, str. 635-643. ISSN 1234-3099. <http://www.discuss.wmie.uz.zgora.pl/php/discuss3.php?ip=&url=pdf&nIdA=25507&nIdSesi=-1>, DOI: [10.7151/dmgt.2032](https://doi.org/10.7151/dmgt.2032). [COBISS.SI-ID [18373465](#)],
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