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, 1st 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:	**Prerequisits:**
Osnove računalništva in informatike	Fundamentals of Computer Science and Informatics

Vsebina:	**Content (Syllabus outline):**
Sistemska programska oprema: operacijski sistem (zgradba OS, vrste in primeri OS), prevajalnik, povezovalnik, nalagalnik, testni program.	System software: operating system (functions of OS, structure of OS, varieties of OS, examples of common OS), compiler, linker, loader, debbuger.
Programsko okolje: priprava programa, prevajanje, testiranje in izvajanje.	Programming environment: program coding, compiling, testing and executing.
Značilnosti sodobnih programskih jezikov.	Characteristics of the state-of-the-art programming languages.
Osnove objektnega programiranja (objekti,	Principles of object-oriented programming

metode, razredi, enkapsulacija, dedovanje, polimorfizem). Modeli matematičnih objektov predstavljeni v izbranem programskem jeziku.	(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:	**Objectives and competences:**
Spoznati zahtevnejše računalniške koncepte: operacijski sistem in druge vrste sistemske programske opreme, računalniška omrežja in sodobne programske jezike.	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:	**Intended learning outcomes:**
Znanje in razumevanje: - Razumevanje zahtevnejših principov računalništva. - Spoznati vrste sistemske programske opreme. - Sposobnost pisanja kompleksnih programov. Prenesljive/ključne spretnosti in drugi atributi: - Prenos znanja računalništva na druga področja (matematika, biologija, kemija, optimizacija, ...).	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, …).

	Delež (v %) / Weight (in %)	
Sprotno preverjanje:		**Mid-term testing:**
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
Izpit:	30%	**Exams:**
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.

Metode poučevanja in učenja:

- Predavanja
- Računalniške vaje

Načini ocenjevanja:

Learning and teaching methods:

- Lectures
- Computer exercises

Assessment:

Reference nosilca / Lecturer's references:

1. ZHU, Enqiang, TARANENKO, Andrej, SHAO, Zehui, XU, Jin. On graphs with the maximum edge metric dimension. Discrete applied mathematics, ISSN 0166-218X. [Print ed.], March 2019, vol. 257, str. 317-324. https://doi.org/10.1016/j.dam.2018.08.031, doi: 10.1016/j.dam.2018.08.031. [COBISS.SI-ID 18584665]
2. PETERIN, Iztok, SCHREYER, Jens, FECKOVÁ ŠKRABUL'ÁKOVÁ, Erika, TARANENKO, Andrej. A note on the Thue chromatic number of lexicographic produts of graphs. Discussiones mathematicae, Graph theory, ISSN 1234-3099, 2018, vol. 38, iss. 3, str. 635-643. http://www.discuss.wmie.uz.zgora.pl/php/discuss3.php?ip=&url=pdf&nIdA=25507&nIdSesji=-1, doi: 10.7151/dmgt.2032. [COBISS.SI-ID 18373465]
3. KELENC, Aleksander, KUZIAK, Dorota, TARANENKO, Andrej, YERO, Ismael G. Mixed metric dimension of graphs. Applied mathematics and computation, ISSN 0096-3003. [Print ed.], 2017, vol. 314, str. 429-438, doi: 10.1016/j.amc.2017.07.027. [COBISS.SI-ID 23331080]
4. BANIČ, Iztok, TARANENKO, Andrej. Measuring closeness of graphs - the Hausdorff distance. Bulletin of the Malaysian Mathematical Society, ISSN 0126-6705, 2017, vol. 40, iss. 1, str. 75-95, doi: 10.1007/s40840-015-0259-1. [COBISS.SI-ID 21722376]
5. KELENC, Aleksander, TARANENKO, Andrej. On the Hausdorff distance between some families of chemical graph. MATCH Communications in Mathematical and in Computer Chemistry, ISSN 0340-6253, 2015, vol. 74, no. 2, str. 223-246. http://match.pmf.kg.ac.rs/electronic_versions/Match74/n2/match74n2_223-246.pdf. [COBISS.SI-ID 21391368]