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**
Enovit magistrski študijski program druge stopnje Predmetni učitelj	**/**	**5.**	**9.**
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**
30			**30**		**120**	**6**

Nosilec predmeta / Lecturer:	Andrej Taranenko

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Jih ni.	None.

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.

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

Modeli matematičnih objektov predstavljeni v izbranem programskem jeziku.

Content (Syllabus outline):

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

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

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

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.):

- K. Watson, Beginning Microsoft Visual C# 2008, Wiley Publishing, 2008.
- D. M. Capper, Introducing C++ for scientists, engineers, and mathematicians, Springer, 2001.
- J. G. Brookshear, Computer science : an overview, Addison-Wesley, 2005.

Cilji in kompetence:

Spoznati zahtevnejše računalniške koncepte: operacijski sistem in druge vrste sistemske 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 sistemske programske opreme.

Intended learning outcomes:

Knowledge and Understanding:

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

• Sposobnost pisanja kompleksnih programov. Prenesljive/ključne spretnosti in drugi atributi: • Prenos znanja računalništva na druga področja (matematika, biologija, kemija, optimizacija, ...).	• Be able to write a complex computer program. Transferable/Key Skills and other attributes: • Knowledge transfer of methods of computer science into other fields (mathematics, chemistry, biology, optimization, …).

Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja Računalniške vaje	Lectures Computer exercises

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
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
Izpit:		Exams:
Pisni izpit – problemi	50%	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. 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]