UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	OSNOVE PROGRAMIRANJA
Course Title:	INTRODUCTION TO PROGRAMMING

Študijski program in stopnja Study Programme and Level	Študijska smer Study Field	Letnik Academic Year	Semester Semester
UŠP Kemijsko inženirstvo, 1. stopnja, UŠP Biokemija, 1. stopnja, UŠP Kemija, 1. stopnja	**/**	**1./2.**	**1./3.**
USP Chemical Engineering, 1st Cycle, USP Biochemistry, 1st Cycle, USP Chemistry, 1st Cycle	**/**	**1st/2nd**	**1st/3rd**

Vrsta predmeta / Course Type: | obvezni / Mandatory

Univerzitetna koda predmeta / University Course Code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Work	Druge oblike študija	Samost. delo Individual Work	ECTS
45	**/**	**30 LV**	**/**	**/**	**75**	**5**

Nosilec predmeta / Lecturer: | izr. prof. dr. Miha Moškon / Dr. Miha Moškon, Assistant Professor

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

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisites:**
Študent oz. kandidat mora imeti predmet opredeljen kot študijsko obveznost.	The course has to be assigned to the student.

Vsebina:	**Content (Syllabus outline):**

Študenti bodo v okviru predmeta spoznali:
  1. Uvod v računalništvo
    a. Programska oprema
    b. Algoritem
  2. Programiranje v Pythonu
    a. Osnove programiranja
    b. Spremenljivke
    c. Osnovni podatkovni tipi
    d. Stavki (priredilni, pogojni, zanke)
    e. Funkcije
    f. Vhod in izhod
    g. Knjižnice
	Students in this course will learn:
	  1. Introduction to computers
	    a. Software
	    b. Algorithm
	  2. Programming in Python
	    a. Basics of programming
	    b. Variables
	    c. Basic data types
	    d. Sentences (assignment, conditional, loops)
	    e. Functions
	    f. Input and output

h. Datoteke	g. Libraries
i. Analiza in vizualizacija podatkov	h. Files (read, write)
j. Iskanje in popravljanje napak	i. Data analysis and visualization
	j. Debugging and handling errors

Temeljna literatura in viri / Readings:

- MOŠKON, Miha. Osnove programiranja v jeziku Python za neračunalničarje. Ljubljana: Fakulteta za računalništvo in informatiko, 2020. 206 str., ilustr. ISBN 978-961-7059-04-5. http://zalozba.fri.uni-lj.si/moskon2020.pdf. [COBISS.SI-ID 32096259]
- MOŠKON, Miha. Osnove programiranja v jeziku Python za neračunalničarje. Ljubljana: Fakulteta za računalništvo in informatiko, 2020. 1 spletni vir (1 datoteka PDF (VII, 206 str.)), ilustr. ISBN 978-961-7059-02-1. http://zalozba.fri.uni-lj.si/moskon2020.pdf. [COBISS.SI-ID 31230723]
- A. Sweigart, Automate the Boring Stuff with Python : Practical Programming for Total Beginners, 2015
- Zapiski s predavanj, vaje, zgledi in povezave objavljene na spletni strani predmeta. / Lecture notes, excercises, examples and links published on the home page of the course.

Dodatna literatura / Additional literature:
- M. Lutz, Learning Python, Fifth Edition, O'Reilly Media, 2013

Cilji in kompetence:	**Objectives and Competences:**
Cilj predmeta je spoznati osnove algoritmičnega razmišljanja in kodiranja v izbranem programskem jeziku - Python. V okviru tega študenti spoznajo osnovne konstrukte programskega jezika.	The aim of this course is to learn the basics of algorithmic thinking and coding in the selected programming language - Python.

Predvideni študijski rezultati:	**Intended Learning Outcomes:**
<u>Znanje in razumevanje</u> Poznavanje programske opreme in uporabe algoritmov. Poznavanje osnovnih programskih konstruktov (spremenljivke, stavki, zanke, funkcije, …) in njihova učinkovita uporaba za reševanje programerskih problemov.	<u>Knowledge and Comprehension</u> Knowledge of software tools and algorithms. Knowledge of basic programming constructs (variables, statements, loops, functions, …) and their efficient use to solve programming problems.
<u>Uporaba</u> Snov predmeta predstavlja osnovno poznavanje računalniške tehnologije, ki se kot orodje uporablja na številnih področjih. Znanje programiranja je temelj za boljše razumevanje delovanja računalnika in programskih orodij, ki jih inženir uporablja pri svojem delu.	<u>Application</u> Subject material represents a basic knowledge of computer technology, which is used as a tool in many areas. Programming knowledge is the basis for a better understanding of computer hardware and software tools that engineer uses in his work.
<u>Refleksija</u> Spoznavanje osnov algoritmičnega razmišljanja in kodiranja računalniškega programa.	<u>Analysis</u> Getting to know basic algorithmic thinking and coding of computer program.

Prenosljive spretnosti	Skill-transference Ability
Poznavanje in uporaba računalniških orodij. Poznavanje in učinkovita uporaba osnovnih konceptov programiranja.	Knowledge and use of computer tools. Knowledge and effective use of basic programming concepts.

Metode poučevanja in učenja:	**Learning and Teaching Methods:**
Predavanja s pomočjo razlage na šolski tabli in uporaba drugih AV sredstev (po potrebi). Praktične vaje potekajo v računalniških učilnicah, kjer študenti samostojno dopolnjujejo pridobljeno znanje. Predavanja s pomočjo različnih AV sredstev. Praktične vaje potekajo v računalniških učilnicah, kjer študenti samostojno dopolnjujejo pridobljeno znanje. Vsi koncepti so predstavljeni na nazoren in sistematski način s številnimi zgledi, poudarek je na njihovi uporabi na praktičnih primerih.	Lectures with the explanation on the blackboard and other audio video (AV) resources (as necessery). Practical exercises take place in computer labs where students independently upgrade achieved knowledge. Lectures with AV. Practical exercises take place in computer labs where students self-complementary knowledge. All concepts are presented in a vivid and systematic way with numerous examples, the emphasis is on their use in practical use cases.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Pisni (nadomestita ga lahko dva pozitivno ocenjena kolokvija) in ustni izpit. Opravljene vaje so pogoj za pristop k izpitu. Ocene: pozitivno 6-10; negativno: 1-5	**100 %**	Written (can be replaced by two positive colloquiums) and oral exam. Settled practical exercises are the prerequisite for the exam. Grades: 6-10 positive; 1-3 negative.

Reference nosilca / Lecturer's references:

Magdevska, Lidija, Mraz, Miha, Zimic, Nikolaj, Moškon, Miha. Initial state perturbations as a validation method for data-driven fuzzy models of cellular networks. BMC bioinformatics, ISSN 1471-2105, Sep. 2018, vol. 19, no. 333, doi: 10.1186/s12859-018-2366-0.

Cvitanović Tomaš, Tanja, Urlep, Žiga, Moškon, Miha, Mraz, Miha, Rozman, Damjana. LiverSex computational model : sexual aspects in hepatic metabolism and abnormalities. Frontiers in physiology, ISSN 1664-042X, Apr. 2018, vol. 9, doi: 10.3389/fphys.2018.00360.

Moškon, Miha, Zimic, Nikolaj, Mraz, Miha. Grohar : automated visualization of genome-scale metabolic models and their pathways. Journal of computational biology, ISSN 1066-5277, May 2018, vol. 25, no. 5, pp. 505-508, doi: 10.1089/cmb.2017.0209.

Vasylchenkova, Anastasiia, Mraz, Miha, Zimic, Nikolaj, Moškon, Miha. Classical mechanics approach applied to analysis of genetic oscillators. IEEE/ACM transactions on computational biology and bioinformatics, ISSN 1545-5963, May/Jun. 2017, vol. 14, no. 3, pp. 721-727, doi: 10.1109/TCBB.2016.2550456.

Cvitanović Tomaš, Tanja, Reichert, Matthias C., Moškon, Miha, Mraz, Miha, Lammert, Frank, Rozman, Damjana. Large-scale computational models of liver metabolism : how far from the clinics?. Hepatology, ISSN 0270-9139, 2017, vol. 66, no. 4, pp. 1323-1334, doi: 10.1002/hep.29268.