

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Programiranje 1
Course title:	Programming 1

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Informatika v sodobni družbi, visokošolski strokovni študijski program prve stopnje	-	Prvi	Prvi
Informatics in Contemporary Society, first cycle Professional Study Programme	-	First	First

Vrsta predmeta / Course type

Obvezni / Obligatory

Univerzitetna koda predmeta / University course code:

1-ISD-VS-P1-2024-09-12

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	/	45	/	/	105	6

Nosilec predmeta / Lecturer: doc. dr. Andrej Dobrovoljc**Jeziki / Languages:****Predavanja / Lectures:** Slovenski / Slovenian, Angleški / English**Vaje / Tutorial:** Slovenski / Slovenian, Angleški / English**Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:**

Pogoj za pristop k izpitu so opravljene vse obveznosti na vajah.

Prerequisites:

Student has to pass all requirements given at the exercises before examination.

Vsebina:

- Splošno o programskem jeziku Python.
- Razvojna okolja.
- Osnovni podatkovni tipi v Pythonu. Spremenljivke in konstante. Operacije in funkcije nad osnovnimi podatkovnimi tipi.
- Zajem, pretvorba in izpis podatkov.
- Primerjalni in logični operatorji, krmilni stavki, zanke.

Content (Syllabus outline):

- General information on Python programming language.
- Development environments.
- Basic data types. Variables and constants. Operations and functions over basic data types.
- Data capturing, conversion and printing.
- Comparison and logical operators, IF clause, Loops (WHILE and FOR).
- Programming errors

- Vrste programerskih napak (šintaktične in semantične).
- Osnove razhroščevanja.
- Definiranje lastnih funkcij in uvoz knjižnic.
- Delo z datotekami
- Podatkovne strukture v Pythonu (nizi, sezname, terke, slovarji, množice, moduli, paketi)
- Obravnava izjem (try, except).
- Osnove objektno orientiranega programiranja.
- Knjižnice in orodja za podatkovno znanost s konkretnimi primeri ter idejami za praktično uporabo (Matplotlib, Numpy, Pandas, Jupyter, Colab)

- Basics of debugging.
- Defining functions and importing libraries.
- Working with files
- Data structures in Python (strings, lists, tuples, dictionaries, sets, modules, packages)
- Handling exceptions (try, except).
- Basics of object-oriented programming.
- Libraries and tools for data science with concrete examples and ideas for practical use (Matplotlib, Numpy, Pandas, Jupyter, Colab)

Temeljni literatura in viri / Readings:

- Moškon, M.: Osnove programiranja v jeziku Python. Založba UL FRI. Ljubljana, 2020
- Summerfeld, M.: Programming in Python 3, A Complete Introduction to the Python Language. Addison-Wesley, 2008
- McKinney, W.: Python for Data Analysis. O'Reilly Media, Inc., 2012
- Demšar, J. Python za programerje. Založba UL FRI. Ljubljana, 2012

Cilji in kompetence:

Učna enota prispeva k razvoju naslednjih splošnih in predmetno-specifičnih kompetenc:

Splošne kompetence:

- poznavanje in razumevanje širokega nabora aplikacij informacijsko komunikacijske tehnologije v sodobni družbi ter razumevanje interakcij med informacijsko komunikacijsko tehnologijo in sodobno družbo;
- sposobnost uporabe znanja v praksi;

Predmetno-specifične kompetence:

- poznavanje osnovnih pojmov računalniškega programiranja
- poznavanje osnov programskega jezika Python
- zmožnost zapisati problem v obliki algoritma in pretvorba algoritma v računalniški program z uporabo sodobnih programskih orodij

Objectives and competences:

The module contributes to the following general and subject-specific competences:

General competences:

- knowledge and understanding of a wide range of applications of ICT in modern society and an understanding of the interaction between information and communication technology and modern society;
- the ability to apply knowledge in practice;

Subject-specific competences:

- knowledge of basic principles of computer programming
- basic knowledge of Python programming language
- ability to write a problem in the form of an algorithm and its conversion into a

- sposobnost samostojnega reševanja realnih problemov s pomočjo računalniškega programiranja

- computer program with the use of modern programming tools
- ability to autonomously solve real life problems with computer programming

Predvideni študijski rezultati:

- Znanje in razumevanje:
- Študent/študentka:*
- razvije zmožnost logičnega razmišljanja in sposobnost načrtovanja programov
 - razume pomen načrtovanja in testiranja programske opreme
 - zmore dekompozicijo večjega problema na več manjših in lažje obvladljivih
 - zna programirati v programskem jeziku Python

Intended learning outcomes:

- Knowledge and understanding:
- The student:*
- develops the ability of logical thinking and designing computer programs
 - understands the importance of software design and testing
 - is able to decompose a bigger problem into a set of smaller ones that are easier to handle
 - knows how to program in Python

Metode poučevanja in učenja:

- *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov)
- *laboratorijske vaje*, kjer bodo študentje na konkretnih problemih ponovili, utrdili in dodatno osvetlili pojme in metode, spoznane na predavanjih
- *projektna naloga* bo študente naučila samostojnega reševanja praktičnih problemov v programiranju

Learning and teaching methods:

- *lectures* with active student participation (explanation, discussion, questions, examples, problem solving)
- *lab work*, during which the students will use practical problems to repeat and strengthen the topics and methods presented at the lectures
- *student project* will prepare the students to autonomously solve practical programming problems

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt):		Type (examination, oral, coursework, project):
<ul style="list-style-type: none"> • pisni izpit • projektna naloga 	80	<ul style="list-style-type: none"> • written exam
	20	<ul style="list-style-type: none"> • project work

Reference nosilca / Lecturer's references:

ČEGOVIK, Tomaž, DOBROVOLJC, Andrej, POVH, Janez, TOMŠIČ, Pavel. Electricity consumption prediction using artificial intelligence. Central European journal of operations research. 2023, vol. 31, str. 833–851, DOI: 10.1007/s10100-023-00844-6.

DOBROVOLJC, Andrej. Odkrivanje potencialnih groženj za informacijski sistem. Revija za univerzalno odličnost : RUO. dec. 2018, vol. 7, št. 4, str. 334-346.

DOBROVOLJC, Andrej, TRČEK, Denis, LIKAR, Borut. Predicting exploitations of information systems vulnerabilities through attackers' characteristics. IEEE access, ISSN 2169-3536, 2017, vol. 5, str. 26063-26075, doi: 10.1109/ACCESS.2017.2769063.

DOBROVOLJC, Andrej. Ranljivosti programske opreme. Novo mesto: Fakulteta za organizacijske študije, 2020 (130 str.)

DOBROVOLJC, Andrej, BUČAR, Jože. Measuring security culture of users of online banking. V: POVH, Janez (ur.). Applied modelling and computing in social science. Frankfurt am Main: PL Academic Research, cop. 2015. Str. 71-79

DOBROVOLJC, Andrej. Towards detection of malicious threats or information systems. V: MILEVA BOSHKOSKA, Biljana (ur.). Towards solving the social science challenges with computing methods. Frankfurt am Main: PL Academic Research, cop. 2015. Str. [69]-80

DOBROVOLJC, Andrej. An approach to predict information system security risks. V: LEVNAJIĆ, Zoran (ur.). Frontiers in ICT : towards Web 3.0. Frankfurt am Main [etc.]: PL Academic Research, an imprint of P. Lang, 2014. Str. 91-101