

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
Razvoj videoiger in razširjenih resničnosti, visokošolski strokovni študijski program prve stopnje	-	Prvi	Prvi
Game and Extended Reality Development, first cycle Professional Study Programme	-	First	First

Vrsta predmeta / Course type

Obvezni / Obligatory

Univerzitetna koda predmeta / University course code:

4-RVRR-VS-P1-2025-02-27

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).

- Vrste programerskih napak (sintaktične 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).

- Programming errors
- 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:

- Sposobnost analitičnega in algoritmičnega razmišljanja.
- Sposobnost fleksibilne uporabe znanja v praksi.
- Usposobljenost za skupinsko delo v vseh fazah razvoja in oblikovanja programske opreme.

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:

- Ability of analytical and algorithmic thinking.
- Ability of flexible usage of knowledge in practice.
- Ability to work as part of a team in all phases of software development and design.

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 computer program with the use of modern programming tools.

- Sposobnost samostojnega reševanja realnih problemov s pomočjo računalniškega programiranja.

- 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.*

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt):

- pisni izpit
- projektna naloga

80
20

Type (examination, oral, coursework, project):

- written exam
- 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