

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Programiranje 2
Course title:	Programming 2

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	Drugi
Game and Extended Reality Development, first cycle Professional Study Programme	-	First	Second

Vrsta predmeta / Course type

Obvezni / Obligatory

Univerzitetna koda predmeta / University course code:

4-RVRR-VS-P2-2025-02-27

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. Bernard Ženko

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 vključitev v delo je vpis v 1. letnik študija. Pogoj za pristop k izpitu so opravljene vse obveznosti na vajah.

Prerequisites:

Enrolment into the first year of the study. Student has to pass all requirements given at the exercises before examination.

Vsebina:

- Uvod: programiranje kot reševanje problemov, kratka zgodovina programiranja, algoritem, diagram poteka in program.
- Programski jezik Java: javanski virtualni računalnik.
- Osnovna orodja za programiranje v Javi.
- Osnovni podatkovni tipi.
- Deklaracije konstant in spremenljivk.

Content (Syllabus outline):

- Introduction: programming as problem solving, brief history of programming, algorithm, flowchart and program.
- Java programming language: Java virtual machine.
- Essential Java programming tools.
- Basic data types.
- Declaring constants and variables.
- Assignments, expressions, operators.
- Control flow statements.

- Prireditveni stavki, izrazi, operatorji.
- Krmilni stavki.
- Tabele, nizi.
- Objektno usmerjeno programiranje: ključni koncepti
- Metode, razredi in objekti, konstruktorji, dedovanje.
- Podprogrami, dogodki, izjeme.
- Uporaba izbranih podatkovnih struktur v Javi.
- Integrirana razvojna okolja.
- Napotki za dobro programiranje.

- Arrays, strings.
- Object oriented programming: key concepts.
- Methods, classes and objects, constructors, inheritance.
- Subroutines, events, exceptions.
- Using selected data structures in Java.
- Integrated development environments.
- Good programming practices.

Temeljni literatura in viri / Readings:

- Gradiva s predavanj in vaj.
- Mesojedec, U. & Fabjan, B. (2004). *Java2: temelji programiranja*. Ljubljana: Pasadena.
- Eck, D. J. (2019). *Introduction to Programming Using Java* (8th ed.). Pridobljeno iz <http://math.hws.edu/javanotes/>.
- Eckel, B. (2006). *Thinking in Java* (4th ed.). Pearson Education.
- Bloch, J. (2017). *Effective Java* (3rd ed.). Pearson Education.

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.
- Sposobnost učinkovitega ustvarjanja projektne dokumentacije, shem, diagramov poteka in oblikovnih rešitev, primernih za razvoj in produkcijo videoiger in razširjenih resničnosti.

Predmetno-specifične kompetence:

- Poznavanje osnovnih pojmov računalniškega programiranja.
- Poznavanje osnov programskega jezika Java.
- 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.
- Ability to effectively produce project documentation, flowcharts, diagrams and design solutions suitable for the development and production of video games and extended reality.

Subject-specific competences:

- Knowledge of basic principles of computer programming.
- Basic knowledge of Java 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.
- Ability to autonomously solve real life problems with computer programming.

- Sposobnost samostojnega reševanja realnih problemov s pomočjo računalniškega programiranja.



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 Java.

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 Java.

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.
- *Project work* will prepare the students to autonomously solve practical programming problems.

Delež (v %) /

Weight (in %)

Načini ocenjevanja:

Assessment:

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

Type (examination, oral, coursework, project):

- pisni izpit
- projektna naloga

80

20

- written exam
- project work

Reference nosilca / Lecturer's references:

- KUNIĆ, ZDRAVKO, ŽENKO, BERNARD, BOSHKOSKA, BILJANA MILEVA. FOCUSED: short-term wind speed forecast correction algorithm based on successive NWP forecasts for use in traffic control decision support systems. Sensors, ISSN 1424-8220, 2021, vol. 21, no. 10, str. 3405-1-3405-17, doi: 10.3390/s21103405.
- GRAU LEGUIA, MARC, LEVNAJIĆ, ZORAN, TODOROVSKI, LJUPČO, ŽENKO, BERNARD. Reconstructing dynamical networks via feature ranking. Chaos, ISSN 1054-1500, 2019, vol. 29, no. 9, str. 09310-1-093107-15, doi: 10.1063/1.5092170.

- PETKOVIĆ, MATEJ, BOUMGHAR, REDOUANE, BRESKVAR, MARTIN, DŽEROSKI, SAŠO, KOCEV, DRAGI, BOUMGHAR, REDOUANE, LEVATIĆ, JURICA, LUCAS, LUKE, OSOJNIK, ALJAŽ, ŽENKO, BERNARD, SIMIDJIEVSKI, NIKOLA. Machine learning for predicting thermal power consumption of the Mars Express spacecraft. *IEEE aerospace and electronic systems magazine*, ISSN 0885-8985, 2019, vol. 34, no. 7, str. 46-60, doi: 10.1109/MAES.2019.2915456.
- SIMIDJIEVSKI, NIKOLA, TANEVSKI, JOVAN, ŽENKO, BERNARD, LEVNAJIĆ, ZORAN, TODOROVSKI, LJUPČO, DŽEROSKI, SAŠO. Decoupling approximation robustly reconstructs directed dynamical networks. *New journal of physics*, ISSN 1367-2630. 2018, 29 str., doi: 10.1088/1367-2630/aae941.
- TUŠAR, TEA, GANTAR, KLEMEN, KOBLAR, VALENTIN, ŽENKO, BERNARD, FILIPIČ, BOGDAN. A study of overfitting in optimization of a manufacturing quality control procedure. *Applied soft computing*, ISSN 1568-4946, 2017, vol. 59, str. 77-87, doi: 10.1016/j.asoc.2017.05.027.
- DEBELJAK, MARKO, POLJANEC, ALEŠ, in ŽENKO, BERNARD (2014) Modelling forest growing stock from inventory data: a data mining approach. *Ecological indicators*, 41, str. 30-39.
- ŠKRABAN, JURE, DŽEROSKI, SAŠO, ŽENKO, BERNARD, MONGUS, DOMEN, GANGL, SIMON in RUPNIK, MAJA (2013) Gut microbiota patterns associated with colonization of different clostridium difficile ribotypes. *PloS ONE*, 8(2), str. e58005-1-e58005-13.
- CAROTENUTO, MARIANEVE, DŽEROSKI, SAŠO, ŽENKO, BERNARD, SLAVKOV, IVICA, et al. (2013) Neuroblastoma tumorigenesis is regulated through the Nm23-H1/h-Prune C-terminal interaction. *Scientific reports*, 3, str. 1351-1-1351-11.
- AHO, TIMO, ŽENKO, BERNARD, DŽEROSKI, SAŠO in ELOMAA, TAPIO (2012) Multi-target regression with rule ensembles. *Journal of machine learning research*, 13, str. 2367-2407.
- DŽEROSKI, SAŠO in ŽENKO, BERNARD (2004) Is combining classifiers with stacking better than selecting the best one? *Machine learning*, 54, str. 255-273.