| UČNI NAČRT PREDMETA / COURSE SYLLABUS | |
|---|---|
| **Predmet:** | Uvod v programiranje |
| **Course title:** | Introduction to Programming |

| Študijski program in stopnja<br>Study programme and level | Študijska smer<br>Study field | Letnik<br>Academic year | Semester<br>Semester |
|---|---|---|---|
| Računalništvo in spletne tehnologije, visokošolski strokovni študijski program prve stopnje | - | Prvi | Prvi |
| Computer Science and Web Technologies, first cycle Professional Study Programme | - | First | First |

**Vrsta predmeta / Course type** | Obvezni / Obligatory

**Univerzitetna koda predmeta / University course code:** | 2-RST-VS- UP-2020-05-14

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

**Nosilec predmeta / Lecturer:** | doc. dr. Bernard Ženko

| **Jeziki /**<br>**Languages:** | **Predavanja /**<br>**Lectures:** | Slovenski / Slovenian, Angleški / English |
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| | **Vaje / Tutorial:** | Slovenski / Slovenian, Angleški / English |

**Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:**

**Prerequisits:**

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

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 in program*: diagrami poteka.
- *Strukturirano in objektno usmerjeno programiranje:* ključni koncepti objektno usmerjenega programiranja.
- *Programski jezik Java:* javanski virtualni računalnik.
- *Osnovni podatkovni tipi.*

**Content (Syllabus outline):**

- *Introduction:* programming as problem solving, brief history of programming.
- *Algorithm and program:* flowcharts.
- *Structured and object oriented programming:* key concepts of object oriented programming.
- *Java programming language:* Java virtual machine.
- *Basic data types.*
- *Declaring constants and variables.*

| | |
|---|---|
| • *Deklaracije konstant in spremenljivk.*<br>• *Prireditveni stavek, izrazi, operatorji.*<br>• *Krmilni stavki.*<br>• *Tabele, nizi.*<br>• *Metode, razredi in objekti, konstruktorji, dedovanje.*<br>• *Podprogrami, dogodki, izjeme.*<br>• *Napotki za dobro programiranje.* | • *Assignments, expressions, operators.*<br>• *Control flow statements.*<br>• *Arrays, strings.*<br>• *Methods, classes and objects, constructors, inheritance.*<br>• *Subroutines, events, exceptions.*<br>• *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. (2008). *Effective Java* (2nd ed.). Pearson Education.

| Cilji in kompetence: | Objectives and competences: |
|---|---|
| *Učna enota prispeva k razvoju naslednjih splošnih in predmetno-specifičnih kompetenc:*<br><br>*Splošne kompetence:*<br>• poznavanje osnov računalništva in informacijske tehnologije<br>• usposobljenost za izvajanje vseh faz razvoja računalniških aplikacij: načrtovanje, razvoj, zagon, prodaja, vzdrževanje<br><br>*Predmetno-specifične kompetence:*<br>• poznavanje osnovnih pojmov računalniškega programiranja<br>• poznavanje osnov programskega jezika Java<br>• zmožnost zapisati problem v obliki algoritma in pretvorba algoritma v računalniški program z uporabo sodobnih programskih orodij<br>• sposobnost samostojnega reševanja realnih problemov s pomočjo računalniškega programiranja | *The module contributes to the following general and subject-specific competences:*<br><br>*General competences:*<br>• familiarity with the basics of computer science and information technology<br>• competence to carry out all phases in the development of computer applications: planning, development, start-up, sales, maintenance<br><br>*Subject-specific competences:*<br>• knowledge of basic principles of computer programming<br>• basic knowledge of Java programming language<br>• 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<br>• ability to autonomously solve real life problems with computer programming |

| Predvideni študijski rezultati: | Intended learning outcomes: |
|---|---|
| Znanje in razumevanje: | Knowledge and understanding: |
| *Študent/študentka:* | *The student:* |
| • razvije zmožnost logičnega razmišljanja in sposobnost načrtovanja programov<br>• razume pomen načrtovanja in testiranja programske opreme<br>• zmore dekompozicijo večjega problema na več manjših in lažje obvladljivih<br>• zna programirati v programskem jeziku Java | • develops the ability of logical thinking and designing computer programs<br>• understands the importance of software design and testing<br>• is able to decompose a bigger problem into a set of smaller ones that are easier to handle<br>• knows how to program in Java |

| Metode poučevanja in učenja: | Learning and teaching methods: |
|---|---|
| • *predavanja* z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri, reševanje problemov)<br>• *laboratorijske vaje*, kjer bodo študentje na konkretnih problemih ponovili, utrdili in dodatno osvetlili pojme in metode, spoznane na predavanjih<br>• *seminarska naloga* bo študente naučila samostojnega reševanja praktičnih problemov v programiranju | • *lectures* with active student participation (explanation, discussion, questions, examples, problem solving)<br>• *lab work*, during which the students will use practical problems to repeat and strengthen the topics and methods presented at the lectures<br>• *student project* will prepare the students to autonomously solve practical programming problems |

| Načini ocenjevanja:<br>Način (pisni izpit, ustno izpraševanje, naloge, projekt): | Delež (v %) /<br>Weight (in %) | Assessment:<br>Type (examination, oral, coursework, project): |
|---|---|---|
| • pisni izpit | 100 | • written exam |

**Reference nosilca / Lecturer's references:**

- 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.

- GAMBERGER, DRAGAN, ŽENKO, BERNARD, MITELPUNKT, ALEXIS, SHACHAR, NETTA, LAVRAČ, NADA. Clusters of male and female Alzheimer's disease patients in the Alzheimer's Disease Neuroimaging Initiative (ADNI) database: Dragan Gamberger ... [et al.]. Brain informatics, ISSN 2198-4026, 2016, vol. 3, no. 3, str. 169-179, doi: 10.1007/s40708-016-0035-5.
- 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.