

| UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18) | | | | | | |
|------------------------------------------------------------------------------|---------------------------|--------------------------------------|------------------------------|-----------------------------------------------|--------------------------------------|-----------------------------|
| Predmet: | | Programiranje 1 | | | | |
| Course title: | | Programming 1 | | | | |
| Študijski program in stopnja Study programme and level | | Študijska smer Study field | | Letnik Academic year | | Semester Semester |
| Univerzitetni študijski program Matematika | | ni smeri | | 2 | | prvi |
| First cycle academic study programme Mathematics | | none | | 2 | | first |
| Vrsta predmeta / Course type | | | | obvezni / compulsory | | |
| Univerzitetna koda predmeta / University course code: | | | | M0212 | | |
| Predavanja Lectures | Seminar Seminar | Vaje Tutorial | Klinične vaje work | Druge oblike študija | Samost. delo Individ. work | ECTS |
| 30 | | 30 | | | 90 | 5 |
| Nosilec predmeta / Lecturer: | | prof. dr. Andrej Bauer | | | | |
| Jeziki / Languages: | | Predavanja / Lectures: | | slovenski / Slovene | | |
| | | Vaje / Tutorial: | | slovenski / Slovene | | |
| Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti: | | | | Prerequisites: | | |
| Vpis v letnik študija. | | | | Enrolment in the programme. | | |
| Opravljen predmet Uvod v programiranje. | | | | Completed course Introduction to programming. | | |
| Vsebina: | | | | Content (Syllabus outline): | | |

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Strukturirano programiranje: podatkovni tipi in abstraktne podatkovne strukture. Implementacija in uporaba osnovnih podatkovnih tipov in struktur v izbranem programskem jeziku. Sezname, drevesa, slovarji in zgoščene tabele.</p> <p>Osnove analize algoritmov. Iskanje z bisekcijo, urejanje z vstavljanjem, hitro urejanje. Uporaba regularnih izrazov.</p> <p>Simbolno računanje: prepisovalna pravila, poenostavljanje izrazov, reševanje enačb, grafični prikaz matematičnih objektov.</p> | <p>Structured programming: data types and abstract data structures. Implementation and use of basic data types and data structures in a selected programming language. Lists, trees, dictionaries and hash tables.</p> <p>Basics of algorithm analysis. Searching by bisection method, insertion sort, quicksort. Use of regular expressions.</p> <p>Symbolic computation: rewrite rules, simplifying expressions, solving equations, graphical representation of mathematical objects.</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Temeljni literatura in viri / Readings:

| |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Priročniki in učbeniki o programiranju v programskem jeziku, ki ga študenti spoznajo. Manuals and textbooks on programming in appropriate programming language.</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Cilji in kompetence:

| |
|-------------------------------------------------------------------------------------------------------------------|
| <p>Študent spozna osnove strukturiranega programiranja in nekatere osnovne podatkovne strukture in algoritme.</p> |
|-------------------------------------------------------------------------------------------------------------------|

Objectives and competences:

| |
|----------------------------------------------------------------------------------------------------------------------------|
| <p>A student gets familiar with the basics of structured programming and certain basic data structures and algorithms.</p> |
|----------------------------------------------------------------------------------------------------------------------------|

Predvideni študijski rezultati:

| |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Znanje in razumevanje: Osnovno znanje vsaj enega programskega jezika in osnovnih programerskih tehnik.</p> <p>Uporaba: Programerske veščine študent uporabi pri ostalih predmetih, ki zahtevajo reševanje problemov z računalnikom.</p> <p>Refleksija: Strukturirano programiranje omogoča abstrakten in konceptualno prečiščen</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Intended learning outcomes:

| |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Knowledge and understanding: Basic knowledge of at least one programming language and basic programming techniques.</p> <p>Application: A student can use the skills of programming at other courses that require problem solving using a computer.</p> <p>Reflection: Structured programming enables abstract and conceptually clean approach to</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

pristop k programiranju, ki sloni na diskretnih strukturah.

Prenosljive spretnosti – niso vezane le na en predmet: Programerske sposobnosti so uporabne pri nadaljnjih računalniških predmetih, kakor tudi pri numeričnih metodah.

programming that is based on discrete structures.

Transferable skills: Programming capabilities are useful in further computer science courses as well as the courses on numerical methods.

Metode poučevanja in učenja:

Predavanja, vaje, domače naloge, konzultacije

Learning and teaching methods:

Lectures, exercises, homework, consultations

| Načini ocenjevanja: | Delež (v %) / Weight (in %) | Assessment: |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Način (pisni izpit, ustno izpraševanje, naloge, projekt):</p> <p>2 kolokvija namesto izpita iz vaj, izpit iz vaj,</p> <p>izpit iz teorije</p> <p>ocene: 1-5 (negativno), 6-10 (pozitivno) (po Statutu UL)</p> | <p>50%</p> <p>50%</p> | <p>Type (examination, oral, coursework, project):</p> <p>2 midterm exams instead of written exam, written exam</p> <p>oral exam</p> <p>grading: 1-5 (fail), 6-10 (pass) (according to the Statute of UL)</p> |

Reference nosilca / Lecturer's references:

Andrej Bauer:

BAUER, Andrej, STONE, Christopher A. RZ: a tool for bringing constructive and computable mathematics closer to programming practice. Journal of logic and computation, ISSN 0955-792X, 2009, vol. 19, no. 1, str. 17-43. [COBISS.SI-ID 15325785]

BAUER, Andrej, TAYLOR, Paul. The Dedekind reals in abstract Stone duality. Mathematical structures in computer science, ISSN 0960-1295, 2009, vol. 19, iss. 4, str. 757-838. [COBISS.SI-ID

15322201]

BAUER, Andrej, BIRKEDAL, Lars. Continuous functionals of dependent types and equilogical spaces. V: CLOTE, Peter G. (ur.). Computer science logic : 14th international workshop, CSL 2000, annual conference of the EACSL, Fischbachau, Germany, August 21-26, 2000 : proceedings, (Lecture notes in computer science, ISSN 0302-9743, 1862). Berlin [etc.]: Springer, 2000, vol. 1862, str. 202-216. [COBISS.SI-ID 10606681]

BAUER, Andrej. Uvod v programiranje v Javi. Ljubljana: [A. Bauer], 2008. 1 optični disk (CD-ROM). [COBISS.SI-ID 14629977]

BAUER, Andrej. Teorija programskih jezikov. Ljubljana: [A. Bauer], 2007. 100 str. [COBISS.SI-ID 14630489]