Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	**Didaktika računalništva 2**
Course title:	DIDACTICS OF COMPUTER SCIENCE 2

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	3, 4	5, 7
Five-year master's degree program Subject Teacher	/		

Vrsta predmeta / Course type Obvezni / Obligatory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
30	15	30			105	180/6

Nosilec predmeta / Lecturer: Igor Pesek

Jeziki / Languages:	**Predavanja / Lectures:**	slovenščina / Slovenian
	Vaje / Tutorial:	slovenščina / Slovenian

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

Vsebina:

- Načrt dela, cilji pouka informatike, kompetence učiteljev informatike v srednjih šolah;
- didaktični elementi izvajanja pouka informatike v srednjih šolah, teorije poučevanja in pouk informatike v srednjih šolah;
- učni načrt in učna gradiva za pouk informatike v srednjih šolah;
- učne metode in oblike pouka informatike v srednjih šolah
- problemski pouk informatike v srednjih šolah
- priprava na pouk informatike v srednjih šolah in evalvacija;

Content (Syllabus outline):

- Learning and working plan, goals of informatics education, competences of informatics teacher in secondary education;
- didactic elements of informatics education in secondary education, theories of teaching and informatics education in secondary education;
- informatics curriculum and educational resources for secondary informatics education;
- education methods and forms in secondary informatics education;
- problem solving in informatics teaching in secondary schools;

- preverjanje in ocenjevanje znanja informatike v srednjih šolah. Avtentične naloge;
- učni prostori za pouk informatike v srednjih šolah in ergonomija;
- učila in učni pripomočki za pouk informatike v srednjih šolah;
- izobraževalna in IKT tehnologija pri pouku informatike v srednjih šolah;
- interesne dejavnosti informatike in računalniška tekmovanja v srednjih šolah;
- sodobni trendi in projekti poučevanja informatike v srednjih šolah;
- splošna in poklicna matura iz informatike.

- lesson planning on informatics in secondary education and evaluation;
- checking and assessment of knowledge in secondary informatics education. Authentic tasks;
- didactic places for teaching informatics in secondary education and ergonomics;
- teaching aids and accessories for secondary informatics education;
- educational and ICT technology in secondary informatics education;
- extracurricular activities of computing and computer competitions in secondary school;
- contemporary trends and projects of secondary informatics education;
- final informatics exam (matura).

Temeljni literatura in viri / Readings:

- Blažič, M.,Ivanuš Grmek, M.,Kramar, M., Strmčnik, F. (2003). Didaktika. Visokošolski učbenik. Novo mesto: Visokošolsko središče, Inštitut za raziskovalno in razvojno delo.
- Gerlič. I. Sodobna informacijska tehnologija v izobraževanju. DZS, Ljubljana, 2000.
- Veljavni predmetniki, učni načrti, učbeniki, delovni zvezki, didaktični kompleti in ostalo didaktično gradivo za pouk informatike v srednjihšolah (syllabuses, learning plans, textbooks, didactic materials for teaching in secondary schools).
- Revije: *Computer education, Monitor, Moj mikro, Presek*
- O naravi učenja, Uporaba raziskav za navdih prakse, Pariz in Ljubljana, OECD in ZRSŠ, 2013
- B. Marentič Požarnik, *Psihologija učenja in pouka,* DZS, 2010.
- Problemi ocenjevanja in devetletna OŠ, Zavod RS za šolstvo, Lj. 2000
- Hazzan, O.,Lapidot, T., Ragonis, N., Guide to Teaching Computer Science, Springer, 2011

Cilji in kompetence:

- Razvoj kompetenc bodočih učiteljev za pripravo, izvedbo in analizo vseh oblik in metod poučevanja računalništva v srednji šoli.
- Podati poglobljeno teoretično in praktično znanje s področja uporabe IKT v izobraževanju in stroki,
- razviti sposobnosti študentov za samostojno in kreativno reševanje praktičnih problemov z uporabo IKT v izobraževanju in študiju.

Objectives and competences:

- development of competences of preservice teachers to prepare, execute and analyse different forms and methods of teaching in primary schools
- Deep theoretical and practical knowledge of using ICT in education and profession,
- deep knowledge of ICT standards and data distributions,
- abilities to creatively solve problems in practice with ICT systems in education and study.

Predvideni študijski rezultati:

- načrtovati različne učne oblike in metode pouka računalništva v srednji šoli;
- analizirati učno uro
- demonstrirati poznavanje teoretičnih izhodišč poučevanja srednješolskega računalništva;
- ovrednotiti učne načrte in obstoječa učna gradiva za pouk informatike in računalništva v srednjih šolah;

Intended learning outcomes:

- to plan different learning forms and methods of Computer science teaching in secondary schools
- analyze teaching hour
- demonstrate the knowledge of theories of computing science teaching and learning in secondary schools;
- evaluate curriculum and materials for CS education;

• obravnavati pomembne didaktične in računalniške razvojne koncepte računalništva v srednji šoli; • organizirati izvedbo pouka računalništva na srednji šoli • uporabiti sodobne oblike ocenjevanja dela in napredka učencev pri pouku računalništva • analizirati srednješolsko zakonodajo • demonstrirati različne možnosti uporabe IKT pri pouku računalništva v srednji šoli. • povezati računalništvo z drugimi predmeti v srednji šoli.	• consider important didactical and CS concepts in secondary schools; • organize CS classroom in secondary school • apply contemporary and adequate type of assessment in CS education; • analyze school legislation for secondary education; • demonstrate possibilities of use of ICT in computing science education in secondary education. • connect CS with other subject in secondary school education.

Metode poučevanja in učenja:	**Learning and teaching methods:**
• Predavanje, razgovor in diskusija, demonstracija, metoda pisnih in grafičnih del, uporaba IKT, reševanje problemskih nalog in preiskovanje, ustvarjanje avtentičnih učnih situacij (mikro pouk), oblike dela (individualno delo, skupinsko delo - kooperativno učenje, timsko delo, delo v dvojicah, frontalno delo), delo z viri. Poučevanje in učenje potekata z didaktično uporabo informacijsko-komunikacijske tehnologije.	• Lecture, conversation and discussion, demonstration, method of written and graphic products, usage of ICT, problem solving and investigation, creation of authentic learning situations (micro teaching), learning forms (individual work, teamwork, group learning (cooperative learning, work in pair, frontal instruction), work with sources. Teaching and learning is done with didactical use od ICT.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
• Portfolio s pisnimi izdelki (učne priprave, analize praktičnega pedagoškega dela, praktično pedagoško delo, seminarska naloga);	20%	• Portfolio with student's works (preparations on lectures, analysis of practical pedagogical work; practical pedagogical work, seminar work);
• opravljen didaktični praktikum	30%	• completed didactics/laboratory work
• pisni izpit	50%	• written exam

Reference nosilca / Lecturer's references:

1. FLOGIE, Andrej, ABERŠEK, Boris, KORDIGEL ABERŠEK, Metka, SÍK LÁNYI, Cecília, PESEK, Igor. Development and evaluation of intelligent serious games for children with learning difficulties : observational study. JMIR serious games : Elektronski vir. 2020, vol. 8, no. 2, str. 1-16, ilustr. ISSN 2291-9279. DOI: 10.2196/13190. [COBISS.SI-ID 13487363]
2. TOMIĆ, Maja Katarina, ABERŠEK, Boris, PESEK, Igor. GeoGebra as a spatial skills training tool among science, technology engineering and mathematics students. Computer applications in engineering education. [Online ed.]. 2019, vol. 27, iss. 6, str. 1506-1517. ISSN 1099-0542. DOI: 10.1002/cae.22165. [COBISS.SI-ID 24744712]
3. WEIGEND, Michael, VANÍČEK, Jiři, PLUHÁR, Zsuzsa, PESEK, Igor. Computational thinking education

through creative unplugged activities. Olympiads in informatics. 2019, vol. 13, str. 171-192. ISSN 1822-7732. DOI: 10.15388/ioi.2019.11. [COBISS.SI-ID 24747016]
4. FLOGIE, Andrej, ABERŠEK, Boris, PESEK, Igor. The impact of innovative learning environments on social competences of youth. Research in learning technology. 2019, vol. 27, str. 1-14. ISSN 2156-7069. DOI: 10.25304/rlt.v27.2214. [COBISS.SI-ID 24743944]
5. ŠORGO, Andrej, DOJER, Brina, GOLOB, Nika, REPNIK, Robert, REPOLUSK, Samo, PESEK, Igor, PLOJ VIRTIČ, Mateja, ŠPERNJAK, Andreja, ŠPUR, Natalija. Opinions about STEM content and classroom experiences as predictors of upper secondary school students' career aspirations to become researchers or teachers. Journal of research in science teaching. Dec. 2018, vol. 55, iss. 10, str. 1448-1468, ilustr. ISSN 0022-4308. DOI: 10.1002/tea.21462. [COBISS.SI-ID 23839240]
6. ŠVERC, Alenka, PESEK, Igor, FLOGIE, Andrej. The challenges of complete informatization of education. V: LAMANAUSKAS, Vincentas (ur.). Philosophy of mind and cognitive modelling in education - 2014. Siauliai: Scientific Methodological Center Scientia Educologica, 2014. Str. 121-131, ilustr. Problems of education in the 21st century, vol. 61. ISSN 1822-7864. http://www.scientiasocialis.lt/pec/node/files/pdf/vol61/121-131.Sverc_Vol.61.pdf. [COBISS.SI-ID 21570824]
7. DOLENC, Kosta, PESEK, Igor, ABERŠEK, Boris. Modular and branched structure of individualized intelligent e-learning materials for science and technology subject course. V: LAMANAUSKAS, Vincentas (ur.). Science, technology, society and education issues - 2013. Siauliai: Scientific Methodological Center Scientia Educologica, 2013. Str. 16-24. Problems of education in the 21st century, vol. 57. ISSN 1822-7864. [COBISS.SI-ID 20324104]