Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	**E-izobraževanje in informacijska tehnologija v fiziki**
Course title:	**E-education and information tehnology in physics**

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	**/**	**4**	**8**
Five-year master's degree program Subject Teacher	**/**		

Vrsta predmeta / Course type	izbirni / elective
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
10	**5**		**30**		**105**	**5**

Nosilec predmeta / Lecturer:	Ivan Gerlič

Jeziki / Languages:	**Predavanja / Lectures:**	slovenski / sloveniane
	Vaje / Tutorial:	slovenski / slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Pogojev ni.	None.

Vsebina:	**Content (Syllabus outline):**

Predavanja:	Lectures:
• Teoretične osnove e-učenja. Modeli uporabe • IKT v izobraževanju. • Strategije uporabe IKT pri pou fizike. Simulatorji in simulacijski sistemi pri poučevanju fizike. Računalniške meritve in krmilno-regulacijski sistemi pri pou fizike. • Temelji elektronske komunikacije učitelj -učeči (elektronska pošta in novice, elektronske distribucijske liste, portali, interaktivne komunikacije, audio in video konference, video na zahtevo…). • Izobraževanje na daljavo pri pou fizike. Sistemi za vodenje in upravljanje e-ucenja – LMS. • •Strokovno-didakticni pristopi v pripravi in • izdelavi e-ucnih gradiv za pouk fizike.	• Base theories of E-education. Models of using • ICT in education. • Strategies of using ICT in physics education. Simulators and simulation systems in physics education. Computer measure and control regulating systems in physics education. • Bases of e-communication teacher mail, e-news, e-distributions lists, portal, internet relay chat, audio and video conference, video on demand…) • Distance learning in physics education. Learning Management System (LMS). • Trade-didactic accessions to prepare and make e-teaching materials in physics education.
Vaje: Vaje aplikativno dopolnjujejo vsebino predavanj z reševanjem razvojno-raziskovalnih in praktičnih problemov.	Labor work: Application of lectures in practical cases and real research problems.

Temeljni literatura in viri / Readings:

Osnovno / primary:

- Gerlič Ivan, Debevc Matjaž, Dobnik Nadja, Šmitek Branislav, Korže Danilo, Stjepanovic Zorna. Načrtovanje in priprava študijskih gradiv za izobraževanje na daljavo. FERI, Maribor, 2002
- Gerlič Ivan. Sodobna informacijska tehnologija v izobraževanju. DZS, Ljubljana, 2000
- Bregar, L., Zagmajster, M., Radovan, M. Osnove e-izobraževanja. Andragoški center Slovenije, Ljubljana, 2010.
- Soleša Dragan. Obrazovna tehnologija. Univeza v Novem Sadu, Sombor, 2006

Cilji in kompetence:	**Objectives and competences:**
Študent usvoji nivo e-kompetentnosti: razume modele uporabe IKT v izobraževanju s poudarkom na pouku fizike. Zna uporabljati in razvijati IKT opremo za poučevanje fizikalnih vsebin ter medijsko in komunikacijsko tehnologijo pri pouku fizike. Kompetentno izvajanja fizikalne meritve v izobraževanju	The student acquires level of e-Competence: Understand models of ICT use in education with a focus on physics. Knows how to use and develop ICT equipment for teaching physics content and media and communication technology in teaching physics. The student is competent in execution of physical measurements in education.

Predvideni študijski rezultati:	**Intended learning outcomes:**

Znanje in razumevanje:	Knowledge and Understanding:
Po uspešno zaključeni učni enoti je študent • zmožen:strokovno-teoretične obravnave ozadja s področja e-izobraževanja v poučevanju fizike,prepoznati prednosti in slabosti uporabe e-izobraževanja v poučevanju fizike, organizirati distribucijo in prenos znanja. Prenesljive/ključne spretnosti in drugi atributi: Študent je sposoben uporabe znanj pri izdelavi kakovostnih e-učnih gradiv ter organizacije in vodenja projektov za izdelavo e-učnih gradiv.	On completion of this course student will be able to: • understand theoretical background of e-education equipment in physics education. • recognize advantages and disadvantages of using eeducation in physics education. • organize distributions and transmissions of knowledge Transferable/Key Skills and other attributes: • Student is able to use lnowledge for development of quality e-teaching materials and organize and manage projects for produce elearning materials.

Metode poučevanja in učenja:	**Learning and teaching methods:**
• eksperimentalna predavanja (razlaga, razgovor, demonstracija), • izdelava seminarske - projektne naloge. • • Poučevanje in učenje potekata z didaktično uporabo informacijsko-komunikacijske tehnologije.	• experimental lectures (explanation, discussion, demonstratin), • seminar – project work. On completion of this course student will be able to: Teaching and learning are done through the didactic use of ICT

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
• opravljena seminarska - projektna naloga, • opravljene vaje z zagovorom, • ustni izpit. Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno. Pozitivna ocena iz zagovora vaj in pozitivna ocena seminarske-projektne naloge sta pogoj za pristop k izpitu.	30% 30% 40%	• completed seminar - project work, • completed laboratory work with evaluation, • oral examination. Each of the mentioned commitments must be assessed with a passing grade. Positive grade of advocacy of laboratory work and positive grade of seminar – project work are a prerequisite for access to the exam.

Reference nosilca / Lecturer's references:

- JESENEK, Dalija, GERLIČ, Ivan, VIŠNIKAR, Anja, REPNIK, Robert, KRALJ, Samo. Thin nematic films : laboratory of physics for topological defects. *Mol. cryst. liq. cryst. (Phila. Pa. : 2003)*, 2012, vol. 553, no. 1, str. 153-160, [COBISS.SI-ID 25534503], [JCR).

- REPNIK, Robert, GERLIČ, Ivan. Liquid crystals and development of natural science competences. *Mol. cryst. liq. cryst. (Phila. Pa. : 2003)*, 2012, vol. 553, no. 1, str. 168-174, [COBISS.SI-ID 19420680], [JCR).
- REPNIK, Robert, CVETKO, Matej, GERLIČ, Ivan. Development of some natural science competences in undergraduate study by training visualization skills on subject liquid crystal phases and structures. *Mol. cryst. liq. cryst. (Phila. Pa. : 2003)*, 2011, vol. 547, no. 1, str. 249-254, [COBISS.SI-ID 19419912], [JCR,).
- GERLIČ, Ivan. Information and communication technology in Slovene education system - present state and trends = Informacijske i komunikacijske tehnologije u slovenskom obrazovnom sustavu - trenutno stanje i trendovi. *Informatologia (Zagreb)*, 2010, vol. 43, no. 2, str. 112-115.
- GERLIČ, Ivan, REPNIK, Robert. Conceptual learning of physics in Slovenian primary schools. V: LAMANAUSKAS, Vincentas (ur.). *Challenges of science, mathematics and technology teacher education in Slovenia*, (Problems of education in the 21st century, vol. 14). Siauliai: Scientific Methodological Center Scientia Educologica, 2009, str. 65-69.