



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 technology 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 / Predavanja / Lectures: slovenski / slovene
Languages: Vaje / Tutorial: slovenski / slovene

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

Obvladovanje računalnika, osnovni multimedijski sistemi

Prerequisites:

Work with the computer, base multimedia systems

Vsebina:

Content (Syllabus outline):

Predavanja:

- 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-didaktični pristopi v pripravi in izdelavi e-ucnih gradiv za pouk fizike.

Vaje:

Vaje aplikativno dopolnjujejo vsebino predavanj z reševanjem razvojno-raziskovalnih in praktičnih problemov.

Lectures:

- 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.

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., Zgajmajster, M., Radovan, M. Osnove e-izobraževanja. Andragoški center Slovenije, Ljubljana, 2010.
- Soleša Dragan. Obrazovna tehnologija. Univeza v Novem Sadu, Sombor, 2006

Cilji in kompetence:

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

Objectives and competences:

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:**

<p><u>Znanje in razumevanje:</u></p> <ul style="list-style-type: none"> • Strokovno-teoretično ozadje s področja e-izobraževanja v poučevanju fizike. • Prednosti in slabosti uporabe e-izobraževanja v poučevanju fizike. • Organizacija distribucije in prenosa znanja. <p><u>Prenesljive/ključne spretnosti in drugi atributi:</u></p> <ul style="list-style-type: none"> • Uporaba znanj pri izdelavi kakovostnih eučnih gradiv. • Organiziranje in vodenje projektov za izdelavo e-učnih gradiv.
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<p><u>Knowledge and Understanding:</u></p> <ul style="list-style-type: none"> • Theoretical background of e-education equipment in physics education. • Advantages and disadvantages of using eeducation in physics education. • Organization of knowledge distributions and knowledge transmission. <p><u>Transferable/Key Skills and other attributes:</u></p> <ul style="list-style-type: none"> • Knowledge for development of quality e-teaching materials. • Organizing and manage projects for produce elearning materials.

Metode poučevanja in učenja:

Learning and teaching methods:

<ul style="list-style-type: none"> • experimentalna predavanja, • izdelava seminarske - projektne naloge.

<ul style="list-style-type: none"> • experimental lectures, • seminar – project work.

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

<ul style="list-style-type: none"> • opravljena seminarska - projektna naloga, 	30%	<ul style="list-style-type: none"> • completed seminar - project work, • completed labour work with evaluation, • oral examination.
<ul style="list-style-type: none"> • opravljene vaje z zagovorom, 	30%	
<ul style="list-style-type: none"> • ustni izpit. 	40%	

Reference nosilca / Lecturer's references:

<ul style="list-style-type: none"> • JESENEK, Dalija, GERLIČ, Ivan, VIŠNIKAR, Anja, REPNIK, Robert, KRALJ, Samo. Thin nematic films : laboratory of physics for topological defects. <i>Mol. cryst. liq. cryst. (Phila. Pa. : 2003)</i>, 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. <i>Mol. cryst. liq. cryst. (Phila. Pa. : 2003)</i>, 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. <i>Mol. cryst. liq. cryst. (Phila. Pa. : 2003)</i>, 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. <i>Informatologia (Zagreb)</i>, 2010, vol. 43, no. 2, str. 112-115. • GERLIČ, Ivan, REPNIK, Robert. Conceptual learning of physics in Slovenian primary schools. V: LAMANAUSKAS, Vincentas (ur.). <i>Challenges of science, mathematics and technology teacher education in Slovenia</i>, (Problems of education in the 21st century, vol. 14). Siauliai: Scientific Methodological Center Scientia Educologica, 2009, str. 65-69.
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