



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Razvoj kompetenc pri pouku fizikalnih vsebin
Course title:	Development of competences at teaching physics content

Študijski program in stopnja	Študijska smer	Letnik	Semester
Study programme and level	Study field	Academic year	Semester
Enovit magistrski študijski program druge stopnje Predmetni učitelj	/	4,5	7,9
Five-year master's degree program Subject Teacher	/		

Vrsta predmeta / Course type

Izbirni / Optional

Univerzitetna koda predmeta / University course code:

Predavanja	Seminar	Vaje	Lab. vaje	Terenske vaje	Samost. delo	ECTS
Lectures	Seminar	Tutorial	Laboratory work	Field work	Individ. work	
30		15			75	4

Nosilec predmeta / Lecturer:

Robert Repnik

Jeziki / Predavanja / Lectures: slovenski / Slovenian

Languages: Vaje / Tutorial: slovenski / Slovenian

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

Pogojev ni.
Priporočljiva znanja: osnovna znanja iz didaktike fizike.

Prerequisites:

None.
Recommended knowledge:
Basic knowledge of didactics of physics

Vsebina:**Predavanja:**

- Uvod.
- Kaj so kompetence (znanja, spretnosti in veščine, odnosi).
- Kompetence v relevantnih uradnih dokumentih EU in Slovenije.
- Ključne, generične, predmetno specifične kompetence.
- Primerjava razumevanja kompetenc v tujini in pri nas, različni nabori kompetenc, odprtost/zaprtost diktacije kompetenc v različnih virih in posledice.
- Kompetence v učnih načrtih in drugih dokumentih s področja poučevanja fizike.
- Razvoj kompetenc v šolski praksi.
- Raziskave, analize in smernice projekta Razvoj naravoslovnih kompetenc.
- Aktualne raziskave na področju razvoja kompetenc pri pouku fizikalnih vsebin.
- Sodobni trendi.

Seminarske vaje:

- Pregled literature in virov (podroben pregled izbranih kompetenc s področja poučevanja fizikalnih vsebin)
- Izvedba primerjalne analize s področja kompetenc doma in v tujini
- Priprava eksperimentalnega didaktičnega gradiva za razvoj izbrane kompetence
- Priprava teoretično-računskega didaktičnega gradiva za razvoj izbrane kompetence
- Priprava portfolia in pisna ter ustna predstavitev (uporaba IKT)

Content (Syllabus outline):**Lectures:**

- Introduction.
- Definition of competences (knowledge, skills and relations)
- Competences relevant for official EU and slovenian documents
- Key, generic, subject specific competences
- Comparison of our understanding of competences with other countries, different sets of competences, openness/ closeness of diction of competences in different sources and its consequences.
- Competences in curriculum and other documets from the field of physics education.
- Development of competences in school practice.
- Research, analysis and guidelines of the project »Development of natural science competences«.
- Modern research on the field of competence development in physics education.

Seminar work:

- Research of literature (In-depth research of chosen competences from the field of physics education)
- Comparison analysis in the field of competences in Slovenia and abroad
- Preparation of experimental didactical material for development of a chosen competence
- Preparation of theoretical didactic material for development of a chosen competence
- Preparation of a portfolio and written and oral presentation (Use of ICT)

Temeljni literatura in viri / Readings:

Osnovni viri:

- Uradni list Republike Slovenije in Evropske unije
- Druga relevantna literatura s področja kompetenc v poučevanju: veljavna zakonodaja s področja osnovnega in srednjega šolstva, uredbe in podzakonski akti
- Učni načrti, pravilniki, priročniki, učbeniki, delovni zvezki, e-gradiva in drugi didaktični dokumenti
- Spletna mesta dostopa do relevantnih dokumentov s področja kompetenc
- Rezultati projekta Razvoj naravoslovnih kompetenc <http://kompetence.uni-mb.si>

Cilji in kompetence:

Cilj predmeta je, da študenti prepoznajo pomen poučevanja fizike v osnovni in srednji šoli, osredotočen na razvoj različnih vrst kompetenc in se usposobijo za samostojno pripravo eksperimentalnih in teoretično-računskih didaktičnih gradiv za razvoj izbrane kompetence.

Objectives and competences:

The objective of this course is for students to learn the significance of teaching physics in primary and secondary school, focused on the development of different variety of competences and train them to individually prepare and conduct experimental, theoretical and didactic materials for development of a chosen competence.

Predvideni študijski rezultati:

Znanje in razumevanje:

Po uspešno zaključeni učni enoti je študent zmožen:

- poiskati relevantne vire o kompetencah ter primerjati različne nabore kompetenc med seboj po v naprej znanih kriterijih
- kritičnega presojanja različnih pojmovanj kompetenc doma in v tujini, še posebej glede odprtosti/zaprтости dikcije kompetence in posledice le-tega,
- samostojne priprave eksperimentalnih in teoretično-računskih didaktičnih gradiv za razvoj izbrane kompetence
- samostojno strokovno raziskovati na področju kompetenc ter o svojih izsledkih pisno in ustno poročati.

Intended learning outcomes:

Knowledge and understanding:

On completion of this course the student will be able to:

- search for relevant literature on competences and compare different sets of competences under different criteria
- critically assess different understandings of competences in Slovenia and other countries, especially in regard to openness/closeness of diction and its consequences
- individually prepare experimental and theoretical didactic material for a chosen competence
- individually do scientific research in the field of competences and report in writing or orally about their results

Prenesljive/ključne spretnosti in drugi atributi:

- Spretnosti komuniciranja: pisno izražanje pri pripravi portfolia o izvedenih aktivnostih na področju kompetenc ter osvojene veščine javnega nastopanja ob predstavitvi portfolia.
- Uporaba informacijske tehnologije: uporaba računalnika in elektronskih informacijskih virov pri iskanju literature in relevantnih informacij.
- Reševanje problemov: organiziranje in izvedba raziskave (analiza in primerjava različnih naborov kompetenc doma in v tujini).

Transferable/Key Skills and other attributes:

- Communication skills: writing skills when preparing portfolio about conducted activities in the field of competences and public performance skills when presenting the portfolio
- Use of information technology: use of computer and on-line information sources when searching for literature and relevant information.
- Problem solving: organisation and conduct of research (analysis and comparison of different sets of competences in Slovenia and other countries)

Metode poučevanja in učenja:

- Predavanja (razlaga, razgovor, demonstracija), eksperimentalna predavanja
 - Seminarske vaje (metoda dela s tekstom, metoda pisnih in grafičnih del, metoda praktičnih del, uporaba simulacij in simulacijskih okolij)
- elementi obrnjenega poučevanja
- Poučevanje in učenje potekata z didaktično uporabo informacijsko-komunikacijske tehnologije.

Learning and teaching methods:

- Lectures (explanation, discussion, demonstration), experimental lectures
 - Seminar work (work with text, work with graphic elements, practical work, use of simulations and simulation environments)
- elements of flipped learning
- Teaching and learning are done through the didactic use of ICT.

Delež (v %) /

Načini ocenjevanja:

Weight (in %)

Assessment:

<ul style="list-style-type: none"> • organiziranje in izvedba raziskave (analiza in primerjava naborov kompetenc pri pouku fizikalnih vsebin) 	20 %	<ul style="list-style-type: none"> • organisation and conduct of a research (analysis and comparison of sets of competences at teaching physics subjects)
<ul style="list-style-type: none"> • priprava dveh didaktičnih gradiv za razvoj izbrane kompetence 	30 %	<ul style="list-style-type: none"> • Preparation of two didactic materials for development of a chosen competence
<ul style="list-style-type: none"> • portfolio o izvedenih aktivnostih in predstavitev 	30 %	<ul style="list-style-type: none"> • portfolio about conducted activities (work and presentation)
<ul style="list-style-type: none"> • ustni izpit <p>Vsaka izmed naštetih obveznosti mora biti opravljena s pozitivno oceno.</p>	20 %	<ul style="list-style-type: none"> • oral examination <p>Each of the mentioned commitments must be assessed with a passing grade.</p>

<p>Pozitivna ocena iz izvedene raziskave, pripravljenega didaktičnega gradiva in predstavitve portfolia so pogoj za pristop k izpitu.</p>		<p>Positive grade of research, preparation of didactic materials and presented portfolio are prerequisite for access to the exam.</p>
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Reference nosilca / Lecturer's references:

<ul style="list-style-type: none"> • REPNIK, Robert, AMBROŽIČ, Milan. Practical school experiments with the centre of mass of bodies. <i>CEPS journal : Center for Educational Policy Studies Journal</i>, ISSN 1855-9719, 2018, vol. 8, no. 1, str. 97-116, ilustr. https://ojs.cepsj.si/index.php/cepsj/article/view/311/270, doi: 10.26529/cepsj.311. [COBISS.SI-ID11972169] • 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. <i>Journal of research in science teaching</i>, ISSN 0022-4308, 2018, str. 1-21, ilustr., doi: doi.org/10.1002/tea.21462. • ÜLEN, Simon, GERLIČ, Ivan, SLAVINEC, Mitja, REPNIK, Robert. Evaluating the effectiveness of physlet-based materials in supporting conceptual learning about electricity. <i>Journal of science education and technology</i>, ISSN 1059-0145, 2017, vol. 26, iss. 2, str. 151-160, tabele, doi: 10.1007/s10956-016-9661-1. [COBISS.SI-ID 22803208]
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