



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 Study programme and level	Študijska smer Study field	Letnik 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 Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje Field work	Samost. delo Individ. work	ECTS
30		15			75	4

Nosilec predmeta / Lecturer:

Robert Repnik

Jeziki / Predavanja / Lectures:

slovenski / slovene

Languages:

Vaje / Tutorial:

slovenski / slovene

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

Osnovna znanja iz didaktike fizike.

Prerequisites:

Basic knowledge of didactics of physics

Vsebina:

Content (Syllabus outline):

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/zaprtoost 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 predstavitve (uporaba IKT)

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)

Temeljna 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 kompetenc. Vedo, kaj so kompetence, poznajo tudi različne vrste kompetenc. Znajo poiskati relevantne vire o kompetencah ter primerjati različne nabore kompetenc med seboj po vnaprej znanih kriterijih. Razvijejo sposobnost kritičnega presojanja različnih pojmovanj kompetenc doma in v tujini, še posebej glede odprtosti/zaprтости dikcije kompetence in posledice le-tega. Usposobijo se za samostojno pripravo eksperimentalnih in teoretično-računskih didaktičnih gradiv za razvoj izbrane kompetence. Razvijejo sposobnost strokovnega raziskovalnega dela ter pisnega in ustnega poročanja o svojem individualnem delu.

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 competences. Students should know what competences are and know different types of competences. They should also learn how to find the appropriate literature and compare different sets of competences under given criteria. Students should also be able to critically assess different understandings of competences in Slovenia and other countries especially openness/closeness of diction of competences and its consequences. During the course students will be prepared for individual preparation and conduct of an experiment and preparation of theoretical didactic material for development of a chosen competence. They will also develop skills in scientific research and written and oral presentation of their individual work.

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

Znanje in razumevanje:

Po zaključku tega predmeta bo študent sposoben

- 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.

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).

Metode poučevanja in učenja:

- Predavanja
- Seminarske vaje

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

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)

Learning and teaching methods:

- Lectures
- Seminar work

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 	20 %	<ul style="list-style-type: none"> • portfolio about conducted activities
<ul style="list-style-type: none"> • predstavitev portfolia 	10 %	<ul style="list-style-type: none"> • portfolio presentation
<ul style="list-style-type: none"> • ustni izpit 	20 %	<ul style="list-style-type: none"> • oral examination

Reference nosilca / Lecturer's references:

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, doi: [10.1080/15421406.2011.609464](https://doi.org/10.1080/15421406.2011.609464). [COBISS.SI-ID [19420680](#)], [JCR, WoS do 5. 11. 2012: št. citatov (TC): 0, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0, Scopus do 16. 10. 2012: št. citatov (TC): 0, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0] tipologija 1.08 -> 1.01

REPNIK, Robert, GRUBELNIK, Vladimir. ICT and competences connected with the subject Environmental education in primary school. *Literacy information and computer education journal*, mar. 2011, vol. 2, iss. 1, str. 270-276. <http://infonomics-society.org/LICEJ/ICT%20and%20Competences%20Connected%20with%20the%20Subject%20Environmental%20Education%20in%20Primary%20School.pdf>. [COBISS.SI-ID [19407624](#)]

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, doi: [10.1080/15421406.2011.572770](https://doi.org/10.1080/15421406.2011.572770). [COBISS.SI-ID [19419912](#)], [JCR, WoS do 22. 5. 2013: št. citatov (TC): 1, čistih citatov (CI): 1, normirano št. čistih citatov (NC): 0, Scopus do 8. 5. 2013: št. citatov (TC): 1, čistih citatov (CI): 1, normirano št. čistih citatov (NC): 0] tipologija 1.08 -> 1.01

REPNIK, Robert, GRUBELNIK, Vladimir. Need for strengthening teachers competences for teaching environmental education in primary school. V: SHONIREGUN, Charles A. (ur.), AKMAYEVA, Galyna (ur.). Canada International Conference on Education, April 4-7, 2011, Toronto, Canada. *CICE-2011 Proceedings*. [Toronto]: Infonomics Society, cop. 2011, str. 64-68. [COBISS.SI-ID [19414536](#)]

REPNIK, Robert, GRUBELNIK, Vladimir. Development of natural science and digital competences by using e-learning materials for third grade of primary-school physics. V: GÓMEZ CHOVA, Louis (ur.), CANDEL TORRES, I. (ur.), LÓPEZ MARTÍNEZ, A. (ur.). *INTED 2011 : International Technology, Education and Development Conference, 5th edition, Valencia (Spain), 7th-9th March, 2011 : conference proceedings cd*. [Compact disc

ed.]. Valencia: International Association of Technology, Education and Development (IATED), 2011, str. 1593-1600. [COBISS.SI-ID [18234632](#)]