



OPIS PREDMETA / SUBJECT SPECIFICATION

Predmet:	Izobraževalna fizika I
Subject Title:	Educational Physics I

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
FIZIKA PHYSICS		1	1

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Lab. work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
15	10				125	5

Nosilec predmeta / Lecturer:

Jeziki / Predavanja / Lecture:
Languages: Vaje / Tutorial:

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

Prerequisites:

Vsebina:

- Razvoj fizike. Metodološko - razvojne osnove pouka fizike. Domače in tuje raziskave poučevanja fizike.
- Kurikularna analiza in struktura učnih programov fizike. Analiza klasične in sodobne fizika v učnih programih.
- Klasična didaktika pouka fizike. Sistemi in projekti pouka fizike v svetu in pri nas. Problemski in eksperimentalni pouk fizike. Učitelj raziskovalec. Delo z nadarjenimi učenci.
- Sodobne smeri v didaktiki pouka fizike – inovativne učne metode in oblike.
- Uvod v izbirne vsebine: Inovativni projekti. Eksperimentalni pouk fizike. Informacijsko-komunikacijska tehnologija (IKT) v fiziki. Korelacijski projekti. Analiza in razvoj kurikulumov. Analiza in razvoj FI učil in učnih pripomočkov. Neformalno izobraževanje fizike.

Contents (Syllabus outline):

- Development of physics. Methodological – developmental bases of physics education. SLO and foreign researches of physics education.
- Curricular analysis and structure of physics curricula. Analysis of classic and modern physics in curricula.
- Classic didactic of physics. Systems and projects of physics education in SLO and world. Problem and experimental physics education. Teacher researcher. Work with gifted students.
- Contemporary directions in physics didactics – innovative didactics methods.
- Introduction to optional subjects: Innovation projects. Experimental physics education. Information and Communication Technologies (ICT) in physics. Correlation projects. Analysis and curricula development. Analysis and development of physical teaching aids and didactic accessories. Unofficial physics education.

Temeljni študijski viri / Textbooks:

- Beiser: Concepts of Modern Physics. New York: Mc Graw-Hill, 1987.
- Campbell, A., McNamara, O., Gilroy, P. (2004). Practitioner Research and Professional Development in Education. London: Paul Chapman Publishing.
- Gerlič: Metodika in metodologija pouka fizike. Maribor: PEF Maribor, 1984.
- Gerlič: Didaktika pouka fizike v osnovni šoli. PEF MB, 1992.
- Gerlič, Udir: Problemski pouk fizike v osnovni šoli. Zavod RS za šolstvo, Ljubljana, 2006.
- Gerlič: Računalništvo v izobraževanju. Maribor: PEF Maribor, 1991.

- Gerlič: Sodobna informacijska tehnologija v izobraževanju. DZS, Ljubljana, 2000.
- Lankshear, C., Knobel, M. (2006). A Handbook for Teacher Research. Glasgow, Open University Press.
- Resnick, D. Halliday: Fundamentals of Physics. London: Wiley and Sons, 1993
- Strnad: Razvoj fizike. Ljubljana: DZS, 1996.
- Strnad. O poučevanju fizike. Sigma-DMFA, Ljubljana 2006.
- Učbeniki, priročniki, napotki za eksperimentalno delo slovenskih in tujih založb.
- Revije: Physics Teacher, Physics Education, Technology & Learning, Computers & Education, Educational Technology in slovenske fizikalne, računalniške ter didaktične revije.

Cilji:

Objectives:

Študent/ka:

- Usvoji znanje o razvoju fizike kot strokovne in izobraževalne znanosti;
- usvoji zahtevnejša strokovna in didaktična znanja za snovanje, artikuliranje, načrtovanje, pripravo in izvajanje, analizo in vrednotenje tradicionalnega in sodobnega pouka fizike.
- Poglobli znanje o tematikah izbirnih predmetov, in sicer z inovativnimi projekti, eksperimentalnim poukom fizike, uporabo informacijsko-komunikacijske tehnologije (IKT) v fiziki, korelacijskimi projekti, analizo in razvojem kurikulumov, analizo in razvojem fizikalnih učil in učnih pripomočkov ter neformalnimi vsebinami izobraževanja fizike.

A student:

- Gets knowledge about development of physics as professional and educational science.
- Gets acquainted with more demanding professional and didactical knowledge for planning, articulation, management and planning of projects, analyses and evaluating of traditional and modern curricula of physics.
- Deepen knowledge about the thematic of elective subjects: experimental physics education, Information and Communication Technologies (ICT) in physics, correlation projects, analysis and curricula development, analysis and development of physical teaching tools and didactic equipment and informal education of physics.

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje:

- Poglobljeno poznavanje in razumevanje didaktike fizike in metodoloških procesov.
- Poglobljeno razumevanje raziskovanja fizikalno-didaktičnih procesov

Prenesljive/ključne spretnosti in drugi atributi:

- Sposobnost kritične uporabe znanstvenih in strokovnih spoznanj s področja didaktike fizike.
- Sposobnost samostojnega raziskovanja.
- Sposobnost jasnega strokovnega pisnega in ustnega izražanja.

Knowledge and Understanding:

- Deep understanding of the subject of didactics of physics and methodological processes.
- Deep understanding of investigation of physical and didactical process.

Transferable/Key Skills and other attributes:

- Ability to critically use and apply scientific and professional findings from didactics of physics.
- Ability of independent research.
- Ability of clear writing and oral expression

Metode poučevanja in učenja:

- Predavanja in seminar, ki bosta temeljila na obravnavi študijskih primerov, eksperimentalni demonstraciji in multimedijski predstavitvi

Learning and teaching methods:

- Lectures and seminar that will be based on the case studies, experimental demonstration and multimedia presentation.

Načini ocenjevanja:

Delež (v %) /
Weight (in %)

Assessment:

- Projektna naloga
- Ustni izpit

40
60

- Project
- Oral examination