



Univerza v Mariboru

Fakulteta za naravoslovje
in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet: Neformalno izobraževanje fizikalnih vsebin
Course title: Informal education of Physics topics

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
FIZIKA		2.	1.
PHYSICS		2.	1.

Vrsta predmeta / Course type

Izbirni iz nabora Fizikalno - didaktični predmeti za modul Izobraževalne fizike 2, 3

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Terenske vaje	Samost. delo Individ. work	ECTS
7	3				290	10

Nosilec predmeta / Lecturer: Mitja Slavinec

Jeziki / Languages:
Predavanja / Lectures: slovenski/Slovenian
Vaje / Tutorial:

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

Ni posebnih pogojev.

Prerequisites:

None.

Vsebina:

1. Oblike neformalnega izobraževanja, izvenšolskih in obšolskih dejavnosti iz fizike
2. Tekmovanja iz znanj

Content (Syllabus outline):

1. Forms of informal education , extracurricular activities and additional curricular activities in Physics Education.
2. Contests in proficiency.

3. Mladinska raziskovalna dejavnost na področju fizike in astronomije
4. Poletne šole in delavnice
5. Fizika v športu, rekreaciji in drugih področjih vsakdanjega življenja
6. Organizacija in vodenje neformalnih oblik izobraževanj iz fizike in astronomije
7. Popularizacija fizike in naravoslovja

3. Youth research activities in the fields of Physics and Astronomy.
4. Summer schools and workshops.
5. Physics in sports, recreation and other spheres of everyday life.
6. Organisation and management of informal forms of education in Physics and Astronomy
7. Popularisation of Physics and Life Sciences

Temeljni literatura in viri / Readings:

- 1) L. L. Christensen, The Hands-On Guide for Science Communicators: A Step-by-Step Approach to Public Outreach, Springer 2007.
- 2) S.M. Stocklmayer, M.M. Gore, C. Bryant, Science Communication in Theory and Practice, Springer 2001
- 3) Gerlič: Metodika in metodologija pouka fizike. Maribor: PEF Maribor, 1984.
- 4) Gerlič, Udir: Problemski pouk fizike v osnovni šoli. Zavod RS za šolstvo, Ljubljana, 2006.

Cilji in kompetence:

Namen predmeta je posredovati temeljna teoretična in praktična znanja potrebna za organizacijo in izvedbo različnih oblik izvenšolskih in obšolskih dejavnosti ter drugih oblik neformalnega izobraževanja iz fizike in astronomije. Študenti si pridobijo tudi znanja in veščine s področja priprave in organizacije tekmovanj, srečanj, delavnic in drugih oblik izvajanja tovrstnih izobraževanj.

Objectives and competences:

The goal of the course is to transfer fundamental theoretical and practical knowledge that is needed for organisation and realization of different forms of extracurricular and additional curricular activities and other forms of informal education of Physics and Astronomy. Students get skills organisational and management skills in preparing contests, meetings, workshops, summer schools etc.

Predvideni študijski rezultati:

Znanje in razumevanje:

Poglobljeno poznavanje in razumevanje izvedbenih oblik neformalnega izobraževanja fizike in astronomije. Pridobiti si izkušnje in znanje pri organizaciji teh vrst izobraževanj.

Prenesljive/ključne spretnosti in drugi atributi:

Organizacijske sposobnosti na področju vodenja in izvedbe prireditev in drugih izvedbenih oblik neformalnega izobraževanja.

Intended learning outcomes:

Knowledge and understanding:

Deep knowledge and understanding of informal forms of education in Physics and Astronomy. To gain experience and knowledge in organisation of such forms of education.

Transferable/Key Skills and other attributes:

Organisational skills in management realisation of projects and other forms of informal forms of education.

Zmožnost vzpostavitve in organizacije neformalnega izobraževanja v okoljih, kjer le-to še ni uveljavljeno.

The ability to re-establish and organise informal education in the areas, where such forms are not present.

Metode poučevanja in učenja:

Predavanja, seminar, samostojno delo študenta

Learning and teaching methods:

Lectures, seminar, individual work of students

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt)		Type (examination, oral, coursework, project):
Pisni izpit	50%	Written exam
Projektna naloga	30%	Project
Seminarska naloga	20%	Seminar coursework

Reference nosilca / Lecturer's references:

1. ÜLEN, Simon, ČAGRAN, Branka, SLAVINEC, Mitja, GERLIČ, Ivan. Designing and evaluating the effectiveness of Physlet-based learning materials in supporting conceptual learning in secondary school physics. *Journal of science education and technology*, ISSN 1059-0145, 2014, vol. 23, iss. 5, str. 658-667, tabele, doi: [10.1007/s10956-014-9492-x](https://doi.org/10.1007/s10956-014-9492-x). [COBISS.SI-ID 20475656]
2. SVETEC, Milan, SLAVINEC, Mitja. Nematic liquid crystal locking menisci. *Advances in condensed matter physics*, ISSN 1687-8108, 2013, vol. 2013, art. ID 756902, str. 1-6. <http://dx.doi.org/10.1155/2013/756902>. [COBISS.SI-ID 19802888]
3. SVETEC, Milan, SLAVINEC, Mitja. Structural transition of nematic liquid crystal in cylindrical capillary as a result of the annihilation of two point defects. *The Journal of chemical physics*, ISSN 0021-9606, 2008, vol. 128, no. 8, str. 084704-1-084704-6, ilustr. <http://link.aip.org/link/?JCPSA6/128/084704/1>, <http://dx.doi.org/10.1063/1.2839301>. [COBISS.SI-ID 15899400]
4. SLAVINEC, Mitja, KRALJ, Samo, ŽUMER, Slobodan, SLUCKIN, T. J. Surface depinning of smectic-A edge dislocations. *Physical review. E*, ISSN 1063-651X, 2001, 63, str. 031705-1-031705-6. [COBISS.SI-ID 1277796]
5. SLAVINEC, Mitja, KRALJ, Samo, ŽUMER, Slobodan. Formation of edge dislocations in the surface constrained smectic a film. *Molecular crystals and liquid crystals science and technology. Section A, Molecular crystals and liquid crystals*, ISSN 1058-725X, 2000, vol. 351, str. 153-160, ilustr. [COBISS.SI-ID 10579464]