



UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

Predmet:	Sodobni pogled na fiziko
Subject Title:	Modern aspects of Physics

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
FIZIKA PHYSICS	-	1 ali 2	1 ali 2

Univerzitetna koda predmeta / University subject code:

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

Nosilec predmeta / Lecturer:

Jeziki / Languages: **Predavanja / Lecture:** slovenski/Slovenian in/and angleški s slovenskim prevodom/English with translation in Slovenian
Vaje / Tutorial:

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

Prerequisites:

Vsebina:

1. Statistična mehanika
2. Statistična termodinamika
3. Kompleksni sistemi in mehka snov
4. Sodobni pogledi na vesolje, različni modeli
5. Analogni pojavi v fiziki delcev in kondenzirani snovi (delci in topološki defekti, značilne lastnosti, anihilacija delcev in defektov)
6. Analogni pojavi v kozmologiji in kondenzirani snovi (zlom simetrije, domenske strukture; kozmološke vzmeti, magnetni monopol, črne luknje)
7. Analogni pojavi v sociologiji in kondenzirani snovi (zlom simetrije, čredni nagon, samo-organizirana kritičnost)

Content (Syllabus outline):

1. Statistical mechanics
2. Statistical thermodynamics
3. Complex systems and soft matter
4. Recent theories of universe
5. Analogous phenomena in particle physics and condensed matter (particles and topological defects, their characteristic inherent properties annihilation of particles and defects)
6. Analogous phenomena in cosmology and condensed matter physics (symmetry breaking, domain structure, cosmological strings, magnetic monopole, black holes)
7. Analogous phenoma in sociology and condensed matter physics (symmetry breaking, self organized criticality)

Temeljni literatura in viri / Textbook:

- 1) S. B Palmer, M. S. Rogalski, Advanced University Physics (CRC Press Inc., 2005).
- 2) M. Kleman, O.D. Lavrentovich, Soft Matter Physics, Springer-Verlag, New York, 2003.
- 3) P. M. Chaikin, T. C. Lubensky, Principles of Condensed Matter Physics, Cambridge University Press, Cambridge, England, 1995.
- 4) Članki v Science, Nature, Scientific American.

Cilji:

Objectives:

Podati strnjen pregled nad fizikalnimi principi v cilju povezati makroskopske in mikroskopske pojave. Cilj je ponoviti in nadgraditi dodiplomsko znanje fizike kot tudi podati referenčni material za poglobljeno obravnavo navedenih področij.

Give a concise and condensed sequence of physical principles that link macroscopic and microscopic phenomena, providing a means for learning and revising as well as reference material for the professional inlook into the areas under consideration.

Predvideni študijski rezultati:

Znanje in razumevanje:
Povezovanje makro in mikroskopskih pojavov

Prenesljive/ključne spretnosti in drugi atributi:
Sposobnost povezovanja makro in mikroskopskih pojavov in aplikacija na probleme v vsakdanjem življenju.

Intended learning outcomes:

Knowledge and Understanding:
Linkage of macroscopic and microscopic phenomena

Transferable/Key Skills and other attributes:
The ability to link the macroscopic and microscopic phenomena and application of knowledge to the problems of everyday life.

Metode poučevanja in učenja:

Predavanja
Seminarji

Learning and teaching methods:

Lectures
Seminar work

Načini ocenjevanja:

Ustni izpit
Seminarska naloga

Delež (v %) /

Weight (in %)

Assessment:

Oral exam
Seminar work

50%

50%