



**UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION**

<b>Predmet:</b>	Pregled moderne fizike
<b>Subject Title:</b>	Overview of modern physics

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 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:**

Predznanje iz moderne fizike in iz kompleksnih sistemov.

**Prerequisites:**

Preknowledge of modern physics and complex systems.

**Vsebina:**

- Sodobni pogledi na vesolje, različni modeli
- Analogni pojavi v fiziki delcev in kondenzirani snovi (delci in topološki defekti, značilne lastnosti, anihilacija delcev in defektov)
- Analogni pojavi v kozmologiji in kondenzirani snovi (zlom simetrije, domenske strukture; kozmološki vzmeti, magnetni monopol, črne luknje)
- Analogni pojavi v sociologiji in kondenzirani snovi (zlom simetrije, čredni nagon, samo-organizirana kritičnost)

**Content (Syllabus outline):**

- Recent theories of universe
- Analogous phenomena in particle physics and condensed matter (particles and topological defects, their characteristic inherent properties annihilation of particles and defects)
- Analogous phenomena in cosmology and condensed matter physics (symmetry breaking, domain structure, cosmological strings, magnetic monopoles, black holes)
- Analogous phenomena in sociology and condensed matter physics (symmetry breaking, self organized criticality)

**Temeljni literatura in viri / Textbook:**

- 1) M. Kleman, O.D. Lavrentovich, Soft Matter Physics, Springer-Verlag, New York, 2003.
- 2) P. M. Chaikin, T. C. Lubensky, Principles of Condensed Matter Physics, Cambridge University Press, Cambridge, England, 1995.
- 3) Članki v Science, Nature, Scientific American.

**Cilji:**

**Objectives:**

Študenti poglobijo znanje s področja analogij v moderni fiziki.

Students acquire advanced knowledge on analogies in modern physics.

**Predvideni študijski rezultati:**

Znanje in razumevanje:  
Razumevanje procesov v naravi.

Prenosljive/ključne spretnosti in drugi atributi:  
Rešitev problemov z matematičnimi orodji, numeričnimi metodami, univerzalnosti v fiziki in celosten pristop k reševanju problemov.

**Intended learning outcomes:**

Knowledge and Understanding:  
Understanding of processes in nature.

Transferable/Key Skills and other attributes:  
Solving of problems with mathematical tools, numerical methods, universalities in physics and gained global approach on solving a problem.

**Metode poučevanja in učenja:**

Metodika obsega teoretičen uvod v problematiko in reševanje posameznih problemov.

**Learning and teaching methods:**

They are based on theoretical introduction and solving of specific problems.

**Načini ocenjevanja:**

Delež (v %) /  
Weight (in %)

**Assessment:**

Seminar  
Ustni izpit

**50**  
**50**

Seminar  
Oral exam