Univerza v Mariboru

Fakulteta za naravoslovje in matematiko

UČNI NAČRT PREDMETA / COURSE SYLLABUS	
Predmet:	**Fizika družbe**
Course title:	**Social physics**

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
FIZIKA, 3. stopnja		**1. ali 2.**	**1., 2. ali 4.**
PHYSICS, 3rd cycle		**1. or 2.**	**1., 2. or 4.**

Vrsta predmeta / Course type	Izbirni za vse module
Univerzitetna koda predmeta / University course code:	

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
15					**165**	**6**

Nosilec predmeta / Lecturer:	**Matjaž Perc**
Jeziki / Languages: **Predavanja / Lectures:**	Slovenski / Slovene
Vaje / Tutorial:	Slovenski / Slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:	**Prerequisits:**
Ni pogojev.	None.

Vsebina:	**Content (Syllabus outline):**
Teorija iger, fizikalna interpretacija Darwinovega zakona evolucije, uspešnost različnih vedenjskih vzorcev v luči fizike, vpliv vedenjskih vzorcev na uspešnost družbe kot celote, nastanek kompleksnih mrež in pojav malega sveta.	Game theory, physical interpretation of the Darwinian law of evolution, successfulness of different behavioural patterns in terms of physics, impacts of different behavioural patterns on the prosperity of society as a whole, emergence of complex networks and the small-world phenomenon.

Temeljni literatura in viri / Readings:

Axelrod, R. M. (19842006, cop.). *The evolution of cooperation* (Revised ed., str. XVI, 241). Basic Books. https://plus.cobiss.net/cobiss/si/sl/bib/58381057

Hofbauer, J., & Sigmund, K. (2002). *Evolutionary games and population dynamics* (Reprinted, str. XXVII, 323). Cambridge University Press. https://plus.cobiss.net/cobiss/si/sl/bib/57806593
Dodatna:

K. Sigmund, *Games of life* (Oxford University Press, Oxford, 1993).

Dodatni znanstveni članki:

A. Szolnoki, et al., Cyclic dominance in evolutionary games: A review, J. R. Soc. Interface 11, 20140735 (2014)

M. Perc and P. Grigolini, Collective behavior and evolutionary games - An introduction, Chaos, Solitons & Fractals 56, 1-5 (2013)

M. Perc and A. Szolnoki, Coevolutionary games - A mini review, BioSystems 99, 109-125 (2010)

Cilji in kompetence:	**Objectives and competences:**
Podati znanje o vedenjskih strategijah v družbi in razumeti njihov uspeh (ali neuspeh) na podlagi fizike.	Deliver knowledge about behavioural patterns in society and understand their success (or failure), in view of the underlying mechanisms of physics.

Predvideni študijski rezultati:	**Intended learning outcomes:**
Znanje in razumevanje: Poglobljeno razumevanje učinkov in potencialov različnih vedenjskih vzorcev v družbi. Prenesljive/ključne spretnosti in drugi atributi: Sposobnost prepoznati in analizirati različne vedenjske vzorce in strategije ter predvideti njihov vpliv na družbo (ali skupino ljudi), ki jim je podvržena.	Knowledge and understanding: The ability to recognize and analyse different behavioural patterns and strategies, and foretell their impact on the affected society (or group of people). Transferable/Key Skills and other attributes: The ability to recognize and analyse different behavioural patterns and strategies, and foretell their impact on the affected society (or group of people).

Metode poučevanja in učenja:	**Learning and teaching methods:**
Predavanja in projektno delo.	Lectures and project work.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	**Assessment:**
Način (pisni izpit, ustno izpraševanje, naloge, projekt)		Type (examination, oral, coursework, project):
Ustni izpit	**50%**	Oral exam
Projekt	**50%**	Project

Reference nosilca / Lecturer's references:

SZOLNOKI, Attila, PERC, Matjaž. Oppressed species can form a winning pair in a multi-species ecosystem. Applied mathematics and computation. [Print ed.]. Feb. 2023, vol. 438, str. 1-8. ISSN 0096-3003. DOI: 10.1016/j.amc.2022.127568. [COBISS.SI-ID 125126147]

İZGI, Burhaneddin, ÖZKAYA, Murat, ÜRE, Nazım Kemal, PERC, Matjaž. Extended matrix norm method : applications to bimatrix games and convergence results. Applied mathematics and computation. [Print ed.]. Feb. 2023, vol. 438, str. 1-11. ISSN 0096-3003. DOI: 10.1016/j.amc.2022.127553. [COBISS.SI-ID 123701251]

ANSARI NASAB, Sheida, PANAHI, Shirin, GHASSEMI, Farnaz, JAFARI, Sajad, RAJAGOPAL, Karthikeyan, GHOSH, Dibakar, PERC, Matjaž. Functional neuronal networks reveal emotional processing differences in children with ADHD. Cognitive neurodynamics. [Online ed.]. Feb. 2022, vol. 16, iss. 1, str. 91-100. ISSN 1871-4099. DOI: 10.1007/s11571-021-09699-6. [COBISS.SI-ID 97830147]