



Univerza v Mariboru
University of Maribor

Fakulteta za naravoslovje in
matematiko
Faculty of natural sciences and
mathematics



UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

Predmet: Subject Title:	Ekonofizika Econophysics
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Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Izobraževalna fizika Educational Physics	/	2,3	4,5,6

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
60		15			105	6

Nosilec predmeta / Lecturer:

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

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

Osnove teorije verjetnosti.

Prerequisites:

Basic knowledge of probability theory.

Vsebina:

Content (Syllabus outline):

Naključni sprehajalec in Berry-Esséen-ova teorema; Lévy-jevi stohastični procesi in limitni teorem stabilne porazdelitve; Stohastični modeli dinamike cen; Skale in korelacije v idealnih in realnih finančnih trgih; ARCH in GARCH procesi; Korelacije in antikorelacije med delnicami; Opcije v idealnih in realnih finančnih trgih.

Random walk and the two Berry-Esséen theorems; Lévy stochastic processes and the Limit theorem for stable distributions; Stochastic models of price dynamics; Scales and correlations in ideal and real financial markets; ARCH and GARCH processes; Correlations and anticorrelations between stocks; Options in ideal and real financial markets.

Temeljni literatura in viri / Textbooks:

R. N. Mantegna in H. E. Stanley, *An introduction to econophysics* (Cambridge University Press, Cambridge, 2000).
R. Cont in P. Tankov, *Financial modelling with jump processes* (Chapman & Hall, London, 2004).

Cilji:

Ponuditi pregled ključnih konceptualnih pristopov, razvitih v okviru klasične fizike, katere je možno konstruktivno uporabiti v ekonomiji.

Objectives:

To provide an overview of key conceptual approaches, derived from classical physical sciences, which may be constructively applied in economy.

Predvideni študijski rezultati:

Znanje in razumevanje:

Obvladovanje ključnih fizikalnih pristopov, ki so uporabni v ekonomiji ter sposobnost samostojnega nadaljnega dela v tej smeri.

Prenesljive/ključne spretnosti in drugi atributi:

Sposobnost integracije v ekonomsko okolje in prosperiranje.

Intended learning outcomes:

Knowledge and Understanding:

Mastering of key physical approaches that are applicable in economy as well as the capability of pursuing research in an independent and autonomous manner.

Transferable/Key Skills and other attributes:

The ability to integrate in an economic environment and prosper.

Metode poučevanja in učenja:

Learning and teaching methods:

Predavanja in individualno raziskovalno delo.

Lectures and individual research work.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
Način (pisni izpit, ustno izpraševanje, naloge, projekt): Ustni izpit Seminarska naloga	70% 30%	Type (examination, oral, coursework, project): Oral exam Written seminar work

Materialni pogoji za izvedbo predmeta :
Učilnica z računalnikom in LCD projektorjem (slednji bo v uporabi le občasno).

Material conditions for subject realization
Classroom with a personal computer and an LCD projector (the latter will be in use only occasionally).