

UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18)						
Predmet:		Izbrana poglavja iz finančne matematike				
Course title:		Topics in financial mathematics				
Študijski program in stopnja Study programme and level		Študijska smer Study field		Letnik Academic year	Semester Semester	
Doktorski študijski program Matematika in fizika		Matematika		1 ali 2	prvi ali drugi	
Doctoral study programme Mathematics and Physics		Mathematics		1 or 2	first or second	
Vrsta predmeta / Course type				izbirni / elective		
Univerzitetna koda predmeta / University course code:				M3122		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30					150	6
Nosilec predmeta / Lecturer:		prof. dr. Janez Bernik, prof. dr. Mihael Perman				
Jeziki / Languages:		Predavanja / Lectures: slovenski / Slovene, angleški / English				
		Vaje / Tutorial: slovenski / Slovene, angleški / English				
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:				Prerequisites:		
Vpis v letnik študija.				Enrolment in the programme.		
Vsebina:				Content (Syllabus outline):		

<p>Izbrane bodo nekatere standardne teme iz podiplomske finančne matematike. Možna poglavja so:</p> <ul style="list-style-type: none"> -Stohastična integracija. -Stohastične diferencialne enačbe. -Vrednotenje opcij. -Stohastična optimalna kontrola. -Optimalno ustavljanje in ameriške opcije <p>Izbira je odvisna od interesov in raziskovalne usmeritve študentov.</p>	<p>The content consists of a selection of standard topics in advanced financial mathematics. Possible chapters are:</p> <ul style="list-style-type: none"> -Stochastic integration. -Stochastic differential equations. -Valuation of options. -Stochastic optimal control. -Optimal stopping and American options. <p>The choice depends on students' research interests.</p>
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Temeljni literatura in viri / Readings:

<p>I. Karatzas, S. E. Shreve, Methods of Mathematical Finance, Springer, 1998</p> <p>D. Revuz, M. Yor, Continuous Martingales and Brownian Motion, Third Edition, Springer, 1999.</p> <p>I. Karatzas, S. E. Shreve, Brownian Motion and Stochastic Calculus, Springer, 1988.</p> <p>T Björk, Arbitrage Theory in Continuous Time, 3rd edition, Oxford, 2009.</p>
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Cilji in kompetence:

<p>Namen predmeta je seznaniti študente z nekaterimi pomembnimi temami finančne matematike.</p>

Objectives and competences:

<p>The main goal of the course is to provide students with some important topics in financial mathematics.</p>
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Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje predstavljenih konceptov.

Sposobnost uporabe pridobljenega znanja in spretnosti.

Knowledge and comprehension of presented concepts.

Ability to use acquired knowledge and skills.

Metode poučevanja in učenja:

Predavanja, konzultacije, reševanje problemov

Learning and teaching methods:

Lectures, consultations, problem sessions

Načini ocenjevanja:

Delež (v %) /

Weight (in %)

Assessment:

Pisni izpit (domače naloge), ustni izpit

Ocene: 1-5 (negativno), 6-10 (pozitivno)

100 %

Written exam (homeworks), oral exam

Grading: 1-5 (fail), 6-10 (pass)

Reference nosilca / Lecturer's references:

BERNIK, Janez, MASTNAK, Mitja, RADJAVI, Heydar. Realizing irreducible semigroups and real algebras of compact operators. Journal of mathematical analysis and applications, ISSN 0022-247X. [Print ed.], 2008, vol. 348, no. 2, str. 692-707. [COBISS.SI-ID 14899289]

BERNIK, Janez, MARCOUX, Laurent W., RADJAVI, Heydar. Spectral conditions and band reducibility of operators. Journal of the London Mathematical Society, ISSN 0024-6107, 2012, vol. 86, no. 1, str. 214-234. [COBISS.SI-ID 16357721]

BERNIK, Janez, MASTNAK, Mitja. Lie algebras acting semitransitively. Linear Algebra and its Applications, ISSN 0024-3795. [Print ed.], 2013, vol. 438, iss. 6, str. 2777-2792. [COBISS.SI-ID 16553561]

PERMAN, Mihael. An excursion approach to Ray-Knight theorems for perturbed Brownian motion. Stochastic Processes and their Applications, ISSN 0304-4149. [Print ed.], 1996, let. 63, str. 67-74.

[COBISS.SI-ID 7621465]

PERMAN, Mihael, WELLNER, Jon A. On the distribution of Brownian areas. *Annals of applied probability*, ISSN 1050-5164, 1996, let. 6, št. 4, str. 1091-1111. [COBISS.SI-ID 7101017]

PERMAN, Mihael, WELLNER, Jon A. An excursion approach to maxima of the Brownian bridge. *Stochastic Processes and their Applications*, ISSN 0304-4149. [Print ed.], 2014, vol. 124, iss. 9, str. 3106-3120. [COBISS.SI-ID 17154393]