

UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2017/18)						
Predmet:		Verjetnost z mero				
Course title:		Probability with measure				
Študijski program in stopnja Study programme and level		Študijska smer Study field		Letnik Academic year	Semester Semester	
Univerzitetni študijski program Finančna matematika		ni smeri		3	prvi	
First cycle academic study programme Financial Mathematics		none		3	first	
Vrsta predmeta / Course type				obvezni / compulsory		
Univerzitetna koda predmeta / University course code:				M0362		
Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30		30			90	5
Nosilec predmeta / Lecturer:		prof. dr. Janez Bernik, prof. dr. Mihael Perman				
Jeziki / Languages:		Predavanja / Lectures:		slovenski / Slovene		
		Vaje / Tutorial:		slovenski / Slovene		
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:				Prerequisites:		
Vpis v letnik študija.				Enrolment in the programme.		
Opravljena predmeta Analiza 2 in Verjetnost 1.				Completed courses Analysis 2 and Probability 1.		
Vsebina:				Content (Syllabus outline):		

<ul style="list-style-type: none"> -σ-algebre, Borelove množice, merljive funkcije. -Definicija mere, primeri. -Abstrakten integral, izrek o monotoni konvergenci, Fatoujeva lema, izrek o dominirani konvergenci. -Produktne mere, Fubinijev izrek. -prostori. -Slučajne spremenljivke kot merljive funkcije. -Porazdelitve kot mere -Pričakovana vrednost. -Pogojna pričakovana vrednost, Radon-Nikodým izrek. 	<ul style="list-style-type: none"> -σ-algebras, Borel sets, measurable functions. -Definition of measure, examples. -Abstract integral, monotone convergence theorem, Fatou's lemma, dominated convergence theorem. -Product measures, Fubini's theorem. - spaces. -Random variables as measurable functions. -Distributions. -Expected value. -Conditional expectation, Radon-Nikodým theorem.
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Temeljni literatura in viri / Readings:

<p>B. Magajna, Osnove teorije mere, DMFA, 2001.</p> <p>T. Tao, An introduction to measure theory, American Mathematical Society, 2011.</p> <p>D. Khoshnevisan, Probability, American Mathematical Society, 2007.</p> <p>D. Williams, Probability with Martingales, Cambridge Univeristy Press, 1991.</p> <p>P. Billingsley, Probability and Measure, Wiley, 1979.</p>

Cilji in kompetence:

<p>Finančna matematika temelji na verjetnosti. Teorija mere daje teoretične temelje za verjetnost v obsegu, ki je potreben za trdne definicije in razvoj metod finančne matematike</p>
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Objectives and competences:

<p>Finacial mathematics is based on probability theory. Measure theory provides the theoretical foundations for probability which are necessary for rigorous definitions and development of</p>

v zveznem času.

continuous time finance.

Predvideni študijski rezultati:

Razumevanje abstraktnega okvira verjetnosti, zmnožnost povezave pojmov teorije mere z verjetnostjo.

Intended learning outcomes:

Understanding the abstract framework of probability and the ability to relate probabilistic concepts to measure theoretical concepts.

Metode poučevanja in učenja:

Predavanja, vaje.

Learning and teaching methods:

Lectures, problem sessions.

Načini ocenjevanja:

Delež (v %) /

Weight (in %)

Assessment:

2. kolokvija ali pisni izpit, ustni izpit.

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

100 %

2 midterms or written exam, oral exam.

Grading: 1-5 (fail), 6-10 (pass) (according to the Statute of UL)

Reference nosilca / Lecturer's references:

Mihael Perman:

AHČAN, Aleš, MASTEN, Igor, POLANEC, Sašo, PERMAN, Mihael. Quantile approximations in auto-regressive portfolio models. Journal of Computational and Applied Mathematics, ISSN 0377-0427. [Print ed.], Feb 2011, vol. 235, iss. 8, str. 1976-1983. [COBISS.SI-ID 19878630]

KOMELJ, Janez, PERMAN, Mihael. Joint characteristic functions construction via copulas. Insurance. Mathematics & economics, ISSN 0167-6687, 2010, vol. 47, iss. 2, str. 137-143. [COBISS.SI-ID 16242777]

HUZAK, Miljenko, PERMAN, Mihael, ŠIKIĆ, Hrvoje, VONDRAČEK, Zoran. Ruin probabilities and decompositions for general perturbed risk processes. *Annals of applied probability*, ISSN 1050-5164, 2004, vol. 14, no. 3, str. 1378-1397. [COBISS.SI-ID 13168985]

Janez Bernik:

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]

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, RADJAVI, Heydar. Positivity and matrix semigroups. *Linear Algebra and its Applications*, ISSN 0024-3795. [Print ed.], 2011, vol. 434, iss. 3, str. 801-812. [COBISS.SI-ID 15745625]