

UČNI NAČRT PREDMETA / COURSE SYLLABUS (leto / year 2016/17)						
Predmet:		Verjetnost 1				
Course title:		Probability 1				
Študijski program in stopnja Study programme and level		Študijska smer Study field		Letnik Academic year	Semester Semester	
Univerzitetni študijski program Finančna matematika		ni smeri		2	prvi	
First cycle academic study programme Financial Mathematics		none		2	first	
Vrsta predmeta / Course type				obvezni / compulsory		
Univerzitetna koda predmeta / University course code:				M0360		
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, doc. dr. Dejan Velušček				
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.		
Vsebina:				Content (Syllabus outline):		

<p>Osnove kombinatorike.</p> <p>Množice izidov, dogodki, verjetnost.</p> <p>Pogojna verjetnost, formula za popolno verjetnost, neodvisnost.</p> <p>Diskretne slučajne spremenljivke, porazdelitve.</p> <p>Večrazsežne diskretne porazdelitve.</p> <p>Funkcije diskretnih slučajnih spremenljivk.</p> <p>Pričakovana vrednost in varianca za diskretne slučajne spremenljivke.</p> <p>Pogojne porazdelitve, pogojna pričakovana vrednost.</p> <p>Zvezne slučajne spremenljivke, gosotota, pričakovana vrednost.</p> <p>Rodovne in momentno rodovne funkcije.</p>	<p>Basic combinatorics.</p> <p>Outcome space, events, probability.</p> <p>Conditional probability, formula for total probability.</p> <p>Discrete random variables, distributions.</p> <p>Joint discrete distributions.</p> <p>Functions of discrete random variables.</p> <p>Expectation and variance for discrete random variables.</p> <p>Conditional distributions, conditional expectation.</p> <p>Continuous random variables, densities, expectation.</p> <p>Generating and moment generating functions.</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Temeljni literatura in viri / Readings:

D. Stirzaker, Probability and Random Variables, A beginner's guide, Cambridge University Press, 1999.

G. Grimmett and D. Stirzaker, Probability and Random Processes, Third Edition, Oxford University Press, 1982.

Cilji in kompetence:

Objectives and competences:

Finančna matematika temelji na verjetnosti. Tečaj uvaja osnovne koncepte iz verjetnosti, ki so izhodišče za številne ostale predmete.

Financial mathematics is based on probability theory. This course introduces basic concepts of probability needed for applications.

Predvideni študijski rezultati:

Razumevanje koncepta modeliranja z matematičnimi koncepti verjetnosti, zmožnost učinkovitega računanja s slučajnimi spremenljivkami in njihovimi porazdelitvami.

Intended learning outcomes:

Understanding basic concepts of probability and the ability to do calculations with random variables and distributions effectively.

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:

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]

DÖRSEK, Philipp, TEICHMANN, Josef, VELUŠČEK, Dejan. Cubature methods for stochastic (partial) differential equations in weighted spaces. *Stochastic partial differential equations: analysis and computations*, 2013, vol. 1, iss. 4, str. 634-663. [COBISS.SI-ID 16915289]

OSHIMA, Kojiro, TEICHMANN, Josef, VELUŠČEK, Dejan. A new extrapolation method for weak approximation schemes with applications. *Annals of applied probability*, ISSN 1050-5164, 2012, vol. 22, no. 3, str. 1008-1045. [COBISS.SI-ID 16384857]

KLEP, Igor, VELUŠČEK, Dejan. Central extensions of $[\star]$ -ordered skew fields. *Manuscripta mathematica*, ISSN 0025-2611, 2006, vol. 120, no. 4, str. 391-402. [COBISS.SI-ID 14074457]