

UČNI NAČRT PREDMETA / COURSE SYLLABUS						
<b>Predmet:</b>	Izbrana poglavja iz verjetnosti in statistike					
<b>Course title:</b>	Topics in probability and statistics					
<b>Študijski program in stopnja</b> <b>Study programme and level</b>	<b>Študijska smer</b> <b>Study field</b>		<b>Letnik</b> <b>Academic year</b>		<b>Semester</b> <b>Semester</b>	
3MaFi	Matematika		1 ali 2		prvi ali drugi	
3MaFi	Mathematics		1 or 2		first or second	
<b>Vrsta predmeta / Course type</b>			izbirni			
<b>Univerzitetna koda predmeta / University course code:</b>			M3118			
<b>Predavanja</b> <b>Lectures</b>	<b>Seminar</b> <b>Seminar</b>	<b>Vaje</b> <b>Tutorial</b>	<b>Klinične vaje</b> <b>work</b>	<b>Druge oblike študija</b>	<b>Samost. delo</b> <b>Individ. work</b>	<b>ECTS</b>
30					150	6
<b>Nosilec predmeta / Lecturer:</b>			prof. Janez Bernik, prof. Mihael Perman			
<b>Jeziki / Languages:</b>	<b>Predavanja / Lectures:</b>	slovenski/Slovene, angleški/English				
	<b>Vaje / Tutorial:</b>	slovenski/Slovene, angleški/English				
<b>Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:</b>			<b>Prerequisites:</b>			
<b>Vsebina:</b>			<b>Content (Syllabus outline):</b>			

<p>Izbrane bodo nekatere standardne teme iz podiplomske verjetnosti in statistike. Možna poglavja so:</p> <ul style="list-style-type: none"> <li>- Konvergenca slučajnih spremenljivk.</li> <li>- Pogojna pričakovana vrednost in pogojne porazdelitve.</li> <li>- Martingali</li> <li>- Brownovo gibanje</li> <li>- Ocenjevanje parametrov, optimalnost.</li> <li>- Priezkušanje domnev, optimalnost.</li> <li>- Asimptotske lastnosti cenilk in testov.</li> </ul> <p>Izbira je odvisna od interesov in raziskovalne usmeritve študentov.</p>	<p>The content consists of a selection of standard topics in advanced probability and statistics. Possible topics are:</p> <ul style="list-style-type: none"> <li>- Convergence of random variables.</li> <li>- Conditional expectation and conditional distributions.</li> <li>- Martingales.</li> <li>- Brownian motion.</li> <li>- Parameter estimation, optimality.</li> <li>- Hypothesis testing, optimality.</li> <li>- Asymptotic theory</li> </ul> <p>The choice depends on students' research interests.</p>
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**Temeljni literatura in viri / Readings:**

R. Durrett, Probability: Theory and Examples, Second Edition, Duxbury Press, 1996.  
S. R. S. Varadhan, Probability Theory, American Math. Soc., 2001.  
S. M. Ross, Stochastic Processes, Wiley, 1996  
J. Bertoin, Lévy Processes, Cambridge University Press, 1996.  
M. J. Schervish, Theory of Statistics, Springer, 1995.  
J. Shao, Mathematical Statistics, 3rd edition, Springer, 2007.

**Cilji in kompetence:**

Namen predmeta je seznaniti študente z nekaterimi pomembnimi temami verjetnosti in statistike.

**Objectives and competences:**

The main goal of the course is to provide students with some important topics in probability and statistics.

**Predvideni študijski rezultati:**

**Intended learning outcomes:**

Znanje in razumevanje predstavljenih konceptov.  
Sposobnost uporabe pridobljenega znanja in spretnosti.

Znanje in razumevanje predstavljenih konceptov.  
Sposobnost uporabe pridobljenega znanja in spretnosti.

**Metode poučevanja in učenja:**

Predavanja, konzultacije, reševanje problemov

**Learning and teaching methods:**

Lectures, consultations, problem sessions

Delež (v %) /

**Načini ocenjevanja:**

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)
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**Reference nosilca / Lecturer's references:**

Janez Bernik:

- 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]

Mihael Perman:

- 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. 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. 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]