

<b>Study programme(s):</b> Mathematics (MD)			
<b>Level:</b> PhD studies			
<b>Course title:</b> Stochastic processes and chaos expansions (AN-13)			
<b>Lecturer:</b> Danijela Rajter-Ćirić, Dora Seleši			
<b>Status:</b> elective			
<b>ECTS:</b> 10			
<b>Requirements:</b>			
<b>Learning objectives</b>			
Making students familiar with white noise spaces and chaos expansions in spaces of generalized stochastic functions.			
<b>Learning outcomes</b>			
Acquiring full knowledge in white noise theory, chaos expansion spaces and applications to solving stochastic differential equations.			
<b>Syllabus</b>			
Projective and inductive topology. Nuclear spaces. Hermite polynomials and Hermite functions. White noise space and Wiener-Ito chaos expansion. Hida spaces. Kondratiev spaces. Wick product. Ito and Skorokhod integral. Hermite transform and applications to solving stochastic differential equations.			
<b>Literature</b>			
<ol style="list-style-type: none"> <li>1. H. Holden, B. Oksendal, J. Ubøe, T. Zhang, <i>Stochastic partial differential equations: A modeling, white noise functional approach</i>, Springer Verlag, 1996.</li> <li>2. T. Hida, H. H. Kuo, J. Potthoff, L. Streit, <i>White Noise: An Infinite Dimensional Calculus</i>, Kluwer Academic Publishers, 1993.</li> <li>3. H. H. Kuo, <i>White noise theory</i>. Handbook of stochastic analysis and applications, Statist. Textbooks Monogr., 163, Dekker, New York, 2002.</li> <li>4. F. Biagini, Y. Hu, B. Oksendal, T. Zhang, <i>Stochastic Calculus for Fractional Brownian Motion and Applications</i>, Springer Verlag, 2008.</li> </ol>			
<b>Weekly teaching load</b>			<b>Other:</b>
			0
<b>Lectures:</b>	<b>Exercises</b>	<b>Other forms of teaching:</b>	<b>Student research:</b>
2	0	0	6
<b>Teaching methodology</b>			
Plenary lectures, problem sessions, independent presentations carried out by students.			
<b>Grading method (maximal number of points 100)</b>			
<b>Pre-exam obligations</b>		<b>points</b>	<b>Final exam</b>
Colloquia		50	Oral exam
			<b>points</b>
			50