

Basics of stochastic processes
- **COURSE SYLLABUS**

1.	Course title: <i>Basics of stochastic processes</i>	
2.	Lecturer: <i>dr hab. Mariusz Białecki, prof. IGF PAN</i>	
3.	Field, type and level of studies, year of study: <i>Probabilistic modelling and methods, all years of study</i>	
4.	Course character: <i>monographic lecture</i>	
5.	Teaching method: <i>traditional (or on-line)</i>	
6.	Language:	<i>English</i>
7.	Course type and number of hours: <i>lecture, 30h</i>	
8.	Estimated load of student's independent work:	<i>40-50 h</i>
9.	Total workload and number of ECTS points:	<i>70-80 h, 3 ECTS</i>
10.	Short description and main focus of the course: <i>The lecture is a self-consistent, elementary introduction to discrete probabilistic methods and discrete stochastic processes.</i>	

	<i>The lecture begins with an introduction and discussion of basic concepts of probability theory. The definitions of stochastic and Markov processes will then be introduced. The lecture will be based on concrete examples for detailed implementations.</i> <i>Concepts from related fields, such as information theory, combinatorial methods and graph theory, will also be discussed. Particular attention will be paid to the analysis of waiting time distributions.</i> <i>The lecture will provide a practical introduction to contemporary probabilistic models and methods, based on specific, detailed examples. No prior knowledge of the subject is required, but systematic work on solving the homework problems is necessary.</i>	
11.	References:	<i>will be given on the first lecture</i>
12.	Prerequisites:	<i>basic level of mathematical analysis and algebra</i>
13.	Educational outcomes:	<u>PQF level 8 codes:</u>
	Knowledge: <i>Student knows and understands:</i> - basic concepts of probability theory and stochastic processes - mathematical notion used for description of stochastic systems - methods of identification and analysis of stochastic behaviour in diversified natural phenomena - exemplary qualitative models exhibiting various types of stochastic evolution	P8S_WG
	Practical Skills: <i>Student is able to:</i> - understand various aspect of stochastic evolution manifested in natural phenomena - take advantage of the knowledge gained on the lecture in order to identify and properly recognize characteristic properties of stochastic behaviour in nature - analyse stochastic evolution both qualitatively and quantitatively - properly conclude on the ability of making predictions and their limitations	P8S_UW
	Social Skills: <i>Student is ready to:</i> - apply the acquired knowledge to develop skills and competences in his/her own scientific activity - critically discuss processes occurring in nature and point out their crucial properties - discuss and explain limitations in the ability to predict	P8S_KK

	<i>various natural phenomena</i>	
14.	Evaluation of the educational outcomes:	
	<i>pass with a grade</i>	
15.	Criteria to complete the course:	
	<i>no exam, at least 80% attendance, final grade depends on the evaluation of the homework</i>	
16.	Contact with the lecturer:	
	<i>Email – bialecki@igf.edu.pl</i>	