Master Program "Financial analytics"

Mathematical Support of Financial Solutions

SEMESTER: 2

MODULE: 1-2

Course	**Mathematical Support of Financial Solutions**	
Instructor	**Dmitry V. Berzin, PhD in Mathematics, Associate Professor**	
Credits	ECTS	Hours
	6	**216**
Classes	Lectures (hours)	Seminars (hours)
	42	**56**
Learning outcomes	The students will be able to: • Apply calculus and probability theory to tasks that may appear in real financial research • Analyze cash flows, using mathematical instruments • Prepare for CFA level 1 International Exam (in the part "Quantitative methods") • Solve tasks related to TVM (Time Value of Money) concept, using MS Excel • Apply mathematical methods to selected economic topics through independent research. • Understand the latest developments in financial mathematics. • Follow advanced textbooks or standard journal articles that apply mathematical methods to financial analytics. • Apply mathematical models to analyze contemporary economic issues and real-world problems. • Understand and forecast major trends in economics, using mathematical instruments.	
Topics	1. Simple and compound interest rate. Real and effective interest rate. 2. Cash flows, future value and present value 3. Using MS Excel to solve practical financial tasks. Net present value, internal rate of return, 4. Methods of probability theory for real economic applications. Combinatorics. Mean and variance. Distributions.	
Main literature	1. Mathematics for finance: an introduction to financial engineering / Capinsky M., Zastavnyak T. – Springer, 2003 2. Statistics for business and economics / Newbold P., Carlson W., Thorne B. – Pearson, 2013 3. Microsoft Excel 2013 Bible. The comprehensive tutorial resource / Walkenbach J. – Wiley, 2013	
Assessment	The Final Grade will be summarized of: • Lectures & Seminars Participation Grade - 10 points; • Grade of Work and Activity at Lessons, HomeWorks – 30 points; • Exam Grade – 60 points.	
Teaching Methods	Lectures, seminars, home tasks, problem solving, tests, individual tasks	